CHAPTER 4
AQMP CONTROL STRATEGY

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INTRODUCTION

The overall control strategy in the AQMP provides the path to achieving emission reductions and air quality goals. Implementation of the draft 2003 AQMP is based on a series of control measures that vary by source type (i.e., stationary or mobile) as well as by the pollutant that is being targeted. Although great strides have been made in air pollution control technologies, air quality goals cannot be achieved without significant further emission reductions.

This chapter discusses the control measures for the draft 2003 AQMP and associated emission reductions. Where appropriate, information regarding the differences between the 1997 AQMP, the 1999 amendments to the 1997 ozone SIP and the draft 2003 AQMP are identified. For additional information and details on control measures, please refer to Appendix IV-A: District's Stationary and Mobile Source Control Measures; Appendix IV-B: State and Federal Element; and Appendix IV-C: Transportation Control Measures. For additional information regarding baseline emission projections, please refer to Appendix III.

OVERALL ATTAINMENT STRATEGY

The overall control strategy for this Plan is designed to meet applicable state and federal requirements, including attainment with ambient air quality standards. The focus of the Plan is to demonstrate attainment with the federal PM10 ambient air quality standard by 2006 and with the federal 1-hour ozone in 2010 while making expeditious progress toward attainment of state standards and upcoming new federal standards. Although the draft 2003 AQMP will not address the new federal 8-hour ozone and PM2.5 standards, it is designed to make continued progress toward meeting these standards. The draft 2003 AQMP relies upon the most recent planning assumptions and the best available information such as CARB's EMFAC2002 for on-road mobile source emissions inventory, CARB's off-road model for off-road mobile source emission inventory, latest point source and improved area source inventories as well as the use of the 1997 ozone episodes, expanded air quality modeling analysis, and SCAG's forecast assumptions based on their 2001 Regional Transportation Improvement Plan.

The proposed control measures in the draft 2003 AQMP are based on implementation of all feasible control measures through the application of available technologies and management practices as well as advanced technologies and control methods. These measures rely on proposed actions to be taken by several agencies that currently have the statutory authority to implement such measures. Similar to the 1999 SIP approach, the SIP commitment is to bring each control measure for regulatory consideration in a specified time frame. Each agency is also committed to

achieve a total emission reduction target with the ability to substitute for control measures deemed infeasible, so long as equivalent reductions are met by other means. These measures are also designed to satisfy the federal Clean Air Act requirement of reasonably available control technologies [Section 172(c)], and the California Clean Air Act requirements of Best Available Retrofit Control Technologies (BARCT) [Health and Safety Code Section 40919, Subsection C].

To ultimately achieve ambient air quality standards and demonstrate attainment, additional long-term emissions reductions will be necessary from sources including those primarily under the jurisdiction of the California Air Resources Board (e.g., on-road motor vehicles, off-road equipment, and consumer products) and U.S. Environmental Protection Agency (e.g., aircraft, ships, trains, and pre-empted off-road equipment). Without an adequate and fair share level of reductions from all sources, the emissions reduction burden would unfairly be shifted to sources that have otherwise done their part for clean air.

Designing the Overall Strategy

The basic principles used in designing the overall control strategy were to: 1) meet at least the same overall remaining emissions target committed to in the 1997/1999 SIP; 2) replace long-term measures with more specific near-term measures, where feasible, and 3) develop new short-term control measures and long-term strategies to achieve the needed reductions for attainment demonstration. To develop the control strategy required in the Plan to meet state and federal requirements, an iterative process of technology review and ambient air quality modeling is utilized. Specifically, a remaining emissions target is defined utilizing air quality modeling that will achieve the ambient air quality standards. Technological assessments are then performed to determine if specific technological advancements can be expected to result in meeting this remaining emissions target. Further modeling analyses are conducted using the actual emissions reductions achieved based on the technology forecast. Ultimately an overall emissions target is determined that achieves the ambient air quality standard and for which controls have been proposed. Figure 4-1 illustrates this iterative process used to define the preferred control strategy.

The 1997 AQMP as well as the 1999 amendment to the 1997 California Ozone State Implementation Plan (SIP) control strategies serve as the starting point to demonstrate attainment of both federal PM10 and ozone air quality standards. Additional reductions from implementation of controls on stationary, state and federal sources were then considered in order to demonstrate attainment with the federal air quality standards. Furthermore, these additional control measures are evaluated to determine consistency with potential future air quality standards and ensure the most cost-effective path to meet multiple clean air standards.

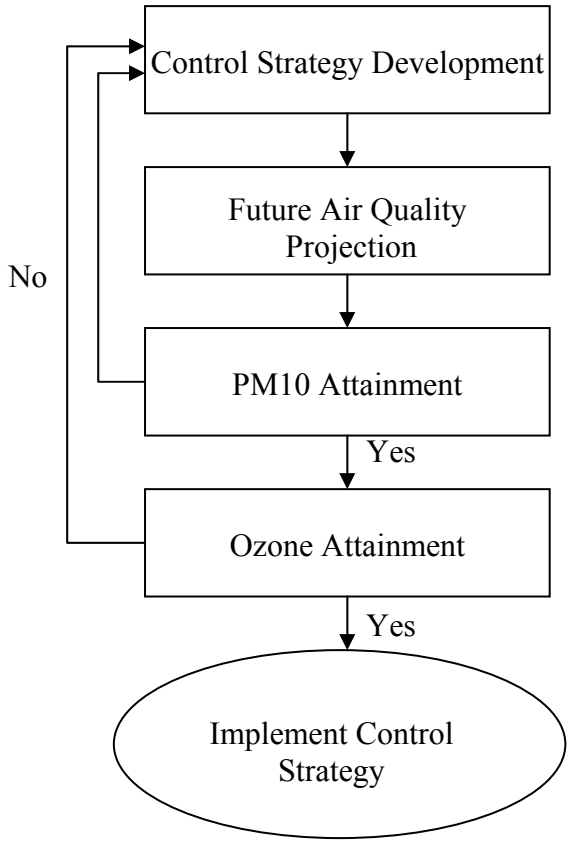


FIGURE 4-1

Iterative Process to Define Emission Reduction Scenario

Draft 2003 AQMP Control Measures

The draft 2003 AQMP control measures consist of: 1) District's Stationary and Mobile Source Control Measures; 2) State and Federal Source Control Measures proposed by California Air Resources Board (CARB); and 3) Transportation Control Measures provided by SCAG. Overall, the Plan includes 27 stationary and 26 mobile source measures which are defined at this time. A summary of these measures is provided below. A detailed description of the control measures is provided in the following appendices:

Draft Appendix IV-A: District's Stationary and Mobile Source Control Measures

Draft Appendix IV-B: State and Federal Element

Draft Appendix IV-C: Transportation Control Measures

These measures primarily rely on the traditional command-and-control approach facilitated by market incentive programs as well as advanced technologies expected to be implemented by 2010.

DISTRICT'S STATIONARY AND MOBILE SOURCE CONTROL MEASURES

Since the adoption of the 1997 AQMP and the 1999 amendment to the 1997 California Ozone SIP (referred to as the 1999 SIP amendment), the District has made significant strides in achieving emission reductions from stationary sources. Table 1-2 of Chapter 1 provides a listing of rules and regulations adopted by the District since adoption of the 1997 AQMP (October 1996) as well as the SIP commitment and the emission reductions achieved for each rule.

For stationary sources under the District's jurisdiction, District staff conducted internal and external brainstorming sessions to solicit additional control concepts and assess control feasibility. The stationary control measures presented in the draft 2003 AQMP are proposed to further reduce emissions from both point sources (permitted facilities) and area (generally small and non-permitted) sources. The basic principles followed in developing the District's stationary source control measures included: 1) meet, at minimum, the same remaining emission reductions committed to in the 1997/1999 SIP for the District's portion, 2) replace long-term measures with more specific short-term measures, where feasible, and 3) identify new control measures to implement all feasible measures. Therefore, the proposed control strategy for stationary sources under the District's jurisdiction include remaining revised and partially implemented measures from the 1997/99 SIP and new measures that are deemed feasible to provide additional control opportunity. All previous long-term measures in the 1997/1999 Plan have been incorporated into the short-term measures with specified SIP reduction commitments. In addition, to foster further technology advancement, a mid-term measure is also included aimed at achieving additional reductions from stationary sources based on implementation and accelerated penetration of advanced technologies. For each control measure, the District will seek to achieve the maximum reduction potential if deemed technically feasible and cost-effective.

Furthermore, in light of significant VOC and NOx reductions needed for attainment demonstration, the District will expand its regulatory programs to mobile sources where the District has existing legal authority and is evaluating the possibility of additional limited authority for cost-effective local controls. Specifically, the District is proposing three new mobile source control measures; namely, a mitigation fee type program for federally-regulated sources (e.g., aircraft, ships, trains), an emission fee program for port-related mobile sources, and regulations for in-use off-road vehicles

and equipment, in the event CARB or U.S. EPA does not develop regulations for these vehicles and equipment.

The draft 2003 AQMP includes 21 short-term stationary and 3 mobile source control measures proposed by the District. These measures are estimated to achieve a total of 21.5 tons per day of VOC, 5.1 tons per day of NOx, 2 to 6 tons per day of PM10, 2.1 tons per day of SOx, and 10.6 tons per day of ammonia emission reductions by 2010 and have proposed rule adoption schedules between 2003 and 2007 with implementation dates between 2004 and 2010. For control measures with quantifiable emission reductions, the District's control strategy as currently proposed will achieve remaining emissions reductions of approximately 64 tons per day of VOC below the 1997/1999 SIP target or 3 tons per day of VOC below the 1994 SIP target.

Appendix IV-A provides detailed descriptions for the District's stationary and mobile source control measures. Overall, thirteen control measures originally contained in the 1997 AQMP or the 1999 SIP amendment have been updated for inclusion into the draft 2003 AQMP. Of thirteen measures, three advanced control measures from the 1999 SIP amendment are now presented as near-term control measures. The eleven new measures incorporated into the 2003 AQMP include: 1) additional NOx reductions from RECLAIM (CMB-10); 2) further PM10 emission reductions from fugitive dust sources (BCM-07); 3) further PM10 emission reductions from aggregate operations (BCM-08); 4) emission reductions from miscellaneous ammonia sources (MSC-04); 5) truck stop electrification (MSC-05); 6) PM10 emission reductions from wood-burning fireplaces and wood stoves (MSC-06); 7) natural gas fuel specifications (MSC-07); 8) further emission reductions for large VOC sources (MSC-08); 9) a mitigation fee program for federally-regulated sources (FSS-05); 10) further emission reductions from in-use off-road equipment and vehicles (FSS-06); and 11) emission fee program for port-related mobile sources (FSS-07).

Table 4-1 provides a listing of the District's short-term stationary and mobile source control measures in the draft 2003 AQMP which are grouped into two main categories: 1) remaining 1997/1999 SIP control measures, and 2) new control measures as described below.

The District's long-term strategy is described in the "Long-Term Control Strategy" section of this chapter.

TABLE 4-1
District's Short-Term Stationary and Mobile Source Control Measures

Control Measure #	Title	Reduction Target[1] (tons/day)
Remaining 1997/1999 SIP Revision Control Measures		
CTS-07:	Further Emission Reductions from Architectural Coatings and Cleanup Solvents (Rule 1113) (VOC)	8.5
CTS-10	Miscellaneous Industrial Coatings & Solvent Operations (VOC)	3.0[2]
FUG-05	Emission Reductions from Fugitive Emission Sources (VOC)	2.0
CMB-07	Emission Reductions from Petroleum Refinery Flares (SOx)	2.1[3]
CMB-09	Emission Reductions from Petroleum Refinery FCCUs (PM10)	0.5[4]
MSC-01	Promotion of Lighter Color Roofing and Road Materials and Tree Planting Programs (All Pollutants)	TBD
MSC-03	Promotion of Catalyst-Surface Coating Technology Programs (All Pollutants)	TBD
PRC-03	Emission Reductions from Restaurant Operations (PM10)	1.0 – 5.0
PRC-07	Industrial Process Operations (VOC)	2.0
WST-01	Emission Reductions from Livestock Waste (VOC/NH_3)	4.8[5]/8.7
WST-02	Emission Reductions from Composting (VOC/NH_3)	1.2/1.9

[1] The emission reduction estimates are based on the 2010 planning inventory in the draft 2003 AQMP. The actual reductions are subject to change during the rulemaking based on the latest available emission inventory data.

[2] An additional 16 tons of VOC emission reductions associated with implementation of Rule 1171 – Solvent Cleaning Operations are subject to technology assessments in 2003 and 2004 prior to implementation in 2005 and are not included in this value.

[3] Smaller concurrent reductions of VOC, NOx, PM10, and CO emissions are also expected from implementation of this control measure.

[4] PM10 emission reductions are expected to be 4.8 tons per day if condensables are included of which 0.5 tons per day are filterable PM10, included in the AQMP baseline.

[5] VOC reductions achieved through dairy relocations, updated annual population, and the Regional Water Quality Control Board Regulations.

FSS-04	Emission Charges of $5,000 per Ton of VOC for Stationary Sources Emitting Over 10 Tons per Year (VOC)	TBD
FLX-01	Economic Incentive Programs (All)	TBD

TABLE 4-1 (continued)
District's Short-Term Stationary and Mobile Source Control Measures

Control Measure #	Title	Reduction Target[1] (tons/day)
New Control Measures		
CMB-10	Additional NO_x Reductions for RECLAIM (NO_x)	3.0
BCM-07	Further PM10 Reductions from Fugitive Dust Sources (PM10)	TBD
BCM-08	Further Emission Reductions from Aggregate and Cement Plant Manufacturing Operations (PM10)	0.7
MSC-04	Emission Reductions from Miscellaneous Ammonia Sources (NH_3)	TBD
MSC-05	Truck Stop Electrification (NOx)	2.1
MSC-06	Emission Reductions from Wood-Burning Fireplaces and Wood Stoves (PM10)	TBD
MSC-07	Natural Gas Fuel Specifications (NOx)	TBD
MSC-08	Further Emission Reductions from Large VOC Sources (VOC)	TBD
FSS-05	Mitigation Fee Program for Federal Sources (All)	TBD
FSS-06	Further Emission Reductions from In-Use Off-Road Vehicles and Equipment (VOC, NOx, PM10)	TBD
FSS-07	Emission fee program for port-related mobile sources (All Pollutants)	TBD
	Total VOC	**21.5**
	PM10	**2.0 – 6.0**
	NOx	**5.1**
	SOx	**2.1**
	NH_3	**10.6**

[1] The emission reduction estimates are based on the 2010 planning inventory in the draft 2003 AQMP. The actual reductions are subject to change during the rulemaking based on the latest available emission inventory data.

Stationary Source Control Methods and Associated Emission Reductions

Stationary source control measures rely on a variety of control technologies and management practices identified in Table 4-2. Control technologies vary according to the source type and pollutant being controlled and generally include a process or physical modification such as product reformulation, installation of air pollution control equipment, etc. In addition, management modifications include administrative changes such as improved housekeeping techniques, inspection and maintenance programs, etc.

TABLE 4-2

Stationary Source Control Methods

Source Category	Control Method
Coatings and Solvents	• Reformulation • Higher Transfer Efficiency • Process Improvements • Add-On Controls • Alternative Coating and Solvent Application Methods • Market Incentives • Improved Housekeeping Practices
Petroleum Operations and Fugitive VOC Emissions	• Process Modifications • Add-On Controls Systems • Market Incentives • Enhanced Inspection and Maintenance • Improved Vapor Recovery Systems
Combustion Sources	• Add-On Controls • Market Incentives • Process Improvement • Improved Energy Efficiency
Fugitive Dust Sources	• Road Dust Suppression • Watering or Revegetation of Disturbed Surface Areas • Chemical Stabilization of Unpaved Areas • Track-Out Prevention • Reduced Vehicular Speeds on Unpaved Roads • Add-On Controls
Miscellaneous Sources	• Process Modifications and Improvements • Add-On Controls • Best Management Practices • Market Incentives
Compliance Flexibility Programs	• Compliance Flexibility to Lower Costs • Promotion of Early Reductions • Incentivize Clean Technologies • Investment in Clean Technologies

The following text describes a brief description of the District's short-term measures for the seven groups of control measures: Group 1 – Coatings and Solvents; Group 2

– Petroleum Operations and Fugitive VOC Emissions; Group 3 – Combustion Sources; Group 4 – Fugitive Dust Sources; Group 5 – Miscellaneous Sources; Group 6 – Compliance Flexibility Programs; and Group 7 – District's Mobile Source Control Measures.

Coatings and Solvents

Controls for the coatings and solvents category are primarily targeted at reducing VOC emissions. The primary control approach for this category is command and control regulations that lower the allowable VOC content of various coating and solvent categories. As part of control option development, reactivity-based approach will further be evaluated for potential inclusion as a viable compliance option. This category includes two control measures which seek to achieve further reductions from architectural coatings as well as miscellaneous coating and solvent source categories which are briefly described below.

CTS-07 (P3) – FURTHER EMISSION REDUCTIONS FROM ARCHITECTURAL COATINGS (VOC): This control measure proposes to achieve additional VOC emission reductions from architectural coating categories and thinning and clean-up solvents. On-going technical evaluation of coating performance and research to further develop low-VOC and/or low-reactive coating or clean-up materials can provide further reduction opportunities. Control measure CTS-07 will implement the third phase of amendments to Rule 1113 - Architectural Coatings to achieve the level of reductions committed under the SIP settlement.

CTS-10 – MISCELLANEOUS INDUSTRIAL COATINGS AND SOLVENT OPERATIONS (VOC): This control measure is based on CM#99 ADV-CTS included in the 1999 amendment to the 1997 ozone SIP. This measure seeks additional VOC emission reductions from industrial coatings and solvent operations through a comprehensive review of existing Regulation XI and Regulation IV rules. The review would include, but not be limited to, a comparison of VOC limits adopted by other air districts in California, survey of recent BACT determinations, etc. Examples of future technical evaluation may include currently exempt clean-up materials, varnishing oils, aerospace handwipe cleaning operations, etc. Reactivity issues for VOC-containing materials associated with this control measure will also be reviewed.

Petroleum Operations and Fugitive VOC Emissions

Within this category, there is one control measure, which pertains primarily to fugitive VOC emissions from petroleum-related operations and chemical industries. Implementation of this control measure may be through several rulemaking phases targeting specific source categories.

FUG-05 – EMISSION REDUCTIONS FROM FUGITIVE EMISSION SOURCES (VOC): This control measure proposes further VOC emission reductions from fugitive emission sources, such as refineries, oil and gas production facilities, terminals, chemical plants, and manufacturing facilities. Reductions could be achieved through the implementation of facility-specific and SCAQMD-approved compliance plans. As such, compliance flexibility opportunities could be maximized. This measure will implement CM#99 ADV-FUG and portions of CM#99 FUG-04 and CM#99 FUG-05(P3).

Combustion Sources

The three control measures in this category include two control measures from the 1997 AQMP (CMB-07 and CMB-09) and one new control measure (CMB-10).

CMB-07 – EMISSION REDUCTIONS FROM PETROLEUM REFINERY FLARES (ALL POLLUTANTS): This control measure applies to all gas flares used at petroleum refineries, sulfur recovery plants and hydrogen production plants. This measure would consist of a two-step approach. During Step I, data collected from implementing Rule 1118 would be evaluated and assessed to develop an accurate emissions inventory from flare operations. Step II will consist of a thorough investigation of control options to identify the most feasible and cost-effective control strategies available to reduce emissions from refinery flares. The District will work with refineries to identify appropriate control options which may include physical modifications and improvements to operation and maintenance procedures to prevent or minimize upset conditions.

CMB-09 - EMISSION REDUCTIONS FROM PETROLEUM FLUID CATALYTIC CRACKING UNITS (PM10): This control measure seeks to refine the emission inventory and reduce PM10, PM2.5 and NH3 emissions from petroleum fluid catalytic cracking units. The proposed emission control method to reduce emissions would be to improve the operation of electrostatic precipitators (ESP) and cyclones presently installed on the catalytic cracking units, or to replace older equipment with new, more efficient models. A newly installed or upgraded ESP can be expected to achieve up to a 90 percent reduction in PM10 emissions, and significantly reduce emissions of PM2.5 and NH3. Control measure CMB-09 is currently being developed under Proposed Rule 1105.1.

CMB-10 – ADDITIONAL NOX REDUCTIONS FOR RECLAIM (NOx): This new control measure proposes additional emission reductions from the NOx Regional Clean Air Incentives Market (RECLAIM) program (Regulation XX) if additional emission reductions are feasible and needed for attainment demonstration. There are a variety of control strategies that can be implemented, including reducing ending allocations in 2003-2006, overlaying source-specific regulations, excluding

smaller emitting facilities, and/or bifurcated market for powerplants and non-powerplants. Depending on the control strategy implemented, this control measure may affect all NO_x RECLAIM facilities or a portion of the facilities based on their annual emissions or the type of equipment at the facility.

Fugitive Dust Sources

This category includes two new control measures (BCM-07 and BCM-08) which are proposed to achieve further reductions of fugitive PM10 emissions from sources such as paved and unpaved roads, construction and demolition activities, aggregate processing facilities, and cement manufacturing operations by requiring "best available control measures." These measures are proposed in order to ensure that attainment with the federal PM10 standard is demonstrated by 2006 and progress is also made toward meeting the PM2.5 standard.

BCM-07 - FURTHER PM10 REDUCTIONS FROM FUGITIVE DUST SOURCES (PM10): Based on U.S. EPA guidance,[1] previous AQMPs identified "candidate" Best Available Control Measures (BACM) to reduce PM10 emissions from all man-made fugitive dust sources. At the time, these measures were at least as stringent as control measures included in any other PM10 non-attainment plan or achieved in practice. BACM that met established cost and technological feasibility were subsequently adopted as SCAQMD rules in 1997 to meet CAA requirements. Other PM10 non-attainment areas have recently developed and adopted fugitive dust regulations based on special federal requirements or in response to lawsuits. Elements of these new regulations contain requirements that may improve the effectiveness of the District's fugitive dust control program. A review of existing District's BACM rules is proposed to consider enhancements that would further reduce PM10 emissions from paved and unpaved roads, construction/demolition and earth-movement activities, disturbed vacant lands, and agricultural sources. Based on a preliminary review of other air districts' recently adopted rules, potential District rule enhancements may include: improved compliance test methods, specific short- and long-term soil stabilization requirements, construction project signage, and mandatory use of track-out control devices (e.g., access road paving). Furthermore, the BACM review will consider regulations for specific geographic areas to provide additional compliance margin for PM10 attainment demonstration in 2006.

BCM-08 – FURTHER EMISSION REDUCTIONS FROM AGGREGATE OPERATIONS (PM10): This control measure proposes to establish prescriptive measures to control fugitive dust from area sources within aggregate facilities and cement manufacturing plants. Aggregate plants produce sand and gravel and crushed

[1] U.S. EPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, September 1992 (EPA-450/2-92-004).

stone, which generate particulate matter in the form of fugitive dust. Examples of such requirements include pre-application of water prior to material extraction, application of chemical dust suppressants or establishment of a vegetative ground cover to inactive disturbed areas, covering of material conveyors and haul vehicles, and installation of wheel washing systems where haul vehicles exit the site.

Miscellaneous Sources

Twelve measures are proposed under the Miscellaneous Sources category for a variety of sources ranging from service-oriented industries such as restaurants to composting and waste-related emissions (such as livestock waste) to incentive programs. Of these measures, seven are carried over from the 1997/1999 SIP and five are new measures (MSC-04, MSC-05, MSC-06, MSC-07, and MSC-08).

MSC-01 – PROMOTION OF LIGHTER COLOR ROOFING AND ROAD MATERIALS (ALL POLLUTANTS): This measure seeks to provide incentives for voluntary actions to reduce VOC or NOx by lowering the ambient temperature through the use of lighter colored roofing and paving materials. This measure is implemented in part through the U.S. EPA's Cool Communities Program. The U.S. EPA and the SCAQMD have been moving forward with the promotion of the use of lighter color roofing and paving materials. Several demonstration projects are currently being conducted nationally (one with the City of Los Angeles). In addition, tree planting programs are being promoted throughout the region. The SCAQMD has sponsored several studies to further quantify the benefits of these actions.

MSC-03 – PROMOTION OF CATALYST-SURFACE COATING TECHNOLOGY (OZONE, CO): This control measure proposes to reduce ozone and CO emissions through a regional-scale use of ozone destroying catalyst coatings. Several field studies have been conducted to demonstrate the efficacy of the use of the ozone destroying catalyst and preliminary results do indicate reductions in ozone concentrations when the catalyst is used. There are ongoing technical research studies and projects demonstrating the relationship between the amounts of ozone destroyed and the amount of VOC and/or NOx emissions reduced under various meteorological and geographic conditions. In addition, staff is reviewing the CARB's LEV II Program that contains an element to allow for VOC credits for the use of catalyst surface coating in mobile source applications. If the mobile source credit approach is found to be applicable to stationary sources, staff will develop an incentives program for stationary sources.

MSC-04 – EMISSION REDUCTIONS FROM MISCELLANEOUS AMMONIA SOURCES (AMMONIA): This new control measure proposes to develop a comprehensive plan by evaluating possible control options for reducing ammonia emissions in the Basin. Ammonia reacts in the atmosphere with gaseous

nitric and sulfuric acid to form secondary particles which contribute to PM10 and PM2.5 levels in the Basin. To expeditiously attain the PM10 standard and make progress toward the PM2.5 standard, further reductions of certain ammonia sources may be necessary. The control measure proposes to further refine the ammonia emissions inventory and identify potential control methods or technologies for various sources of ammonia emissions such as motor vehicles, poultry and other livestock operations, composting operations, and other stationary sources.

MSC-05 – TRUCK STOP ELECTRIFICATION (ALL POLLUTANTS): This new control measure will require the mandatory installation of electric systems at truck stops that can provide heating, ventilating, and air conditioning to truck cabs, run appliances inside truck cabs, and on-board truck systems at truck stops in order to eliminate truck idling thereby eliminating the operation of diesel-fueled engines used by trucks (i.e., during engine idling). In order to reduce or eliminate the operation of auxiliary engines that power refrigeration units on refrigerated trailers, this control measure will also require the installation of external power supplies at truck stops for use by truck operators to power their trailer refrigeration units.

MSC-06 - EMISSION REDUCTIONS FROM WOOD BURNING FIREPLACES AND WOOD STOVES (PM10): This new control measure proposes to reduce PM10 emissions from wood-burning fireplaces and wood stoves used in the Basin. The current PM10 emissions inventory for these units is about 5 tons per day. The measures proposes to further refine the emissions inventory, assess available emissions data and air quality impact for burning manufactured logs versus natural wood, consider control approaches (e.g., U.S. EPA certified wood stoves or fireplace inserts in new residential or public settings), develop incentive programs to encourage the replacement of old wood burning units, and strengthen public awareness and education programs.

MSC-07 – NATURAL GAS FUEL SPECIFICATIONS (NOx): The purpose of this new control measure is to prevent emission increases from the combustion of natural gas with elevated heating value (referred to as "hot gas") in stationary applications. The high heating value of hot gas relative to "normal" natural gas results in increased combustion temperature and, thus, higher NO_x emissions. This control strategy considers setting an upper limit of the heating value of natural gas. Natural gas producers/suppliers could achieve the objective of this control strategy by either not supplying hot gas to the District, or by removing higher hydrogen compounds or otherwise reducing the Btu value of the hot gas.

MSC-08 - FURTHER EMISSION REDUCTIONS FROM LARGE VOC SOURCES (VOC): This new control measure seeks to achieve further emission reductions from the largest stationary sources through implementation of facility-specific emission reduction plans. Under this control measure, facilities will be

required to submit a plan to outline specific measures which would be implemented to reduce their overall emissions beyond the existing regulations and achieve a specified emission reduction target (e.g., 3% - 5% per year from a base year). The reduction targets will be based on technology-based control targets for various source categories which would be developed by District staff and would take into account technical feasibility and cost-effectiveness. Under the District-approved emission reduction plan, facilities would have the flexibility to select the most feasible combination of control technologies for their facility to achieve the required reductions. In addition, emission inventory improvements at these facilities that result in lower emission estimates is considered to be SIP creditable provided a public review process is conducted to solicit comments to make appropriate revisions.

PRC-03 – EMISSION REDUCTIONS FROM RESTAURANT OPERATIONS (PM10): This control measure seeks to reduce PM emissions from charbroilers. Charbroilers consist of three main components: a heating source, a high-temperature radiant surface, and a grill. The grill, which is grated, holds the meat while exposing it to radiant heat. Particulate emissions result from the fat being entrained when dripping grease flares up. Testing has been conducted since 1998 and is an ongoing process to identify effective control technologies for under-fired charbroilers, which contribute to approximately 85 percent of the total PM emission inventory for this source category. This control measure will focus on PM emission reductions; however, concurrent VOC emission reductions may occur.

PRC-07 – INDUSTRIAL PROCESS OPERATIONS (VOC): This control measure, which has evolved from CM#99 ADV-PRC, proposes to refine the emission inventory and further control VOC emissions from miscellaneous chemical processes subject to Regulation XI and Regulation IV rules. Potential control methods include enhanced inspection and maintenance and other housekeeping work practices to reduce fugitive emissions from material transfer, storage, and processing. Process modification may also provide an effective control option to minimize or eliminate emission sources.

WST-01 – EMISSION REDUCTIONS FROM LIVESTOCK WASTE (VOC, AMMONIA): This control measure considers the ammonia and VOC emissions inventory associated with livestock waste and the development and assessment of feasible control approaches. Emission benefits associated with dairy relocations and existing water quality regulations will be taken into account. Potential control options include, but are not limited to, removal of manure out-of-Basin or processing of manure at controlled composting facilities or at anaerobic digesters. VOC and ammonia emission benefits associated with dairy relocations, existing water quality regulations, and control measure WST-01 are estimated to be 4.8 tons per day of VOC and 8.7 tons per day of ammonia emissions in 2010. This control measure is

currently being developed under Proposed Rule 1127 - Emission Reductions from Livestock Waste. PR1127 will seek to achieve additional reductions beyond those anticipated from dairy relocations and water quality regulations.

WST-02 – EMISSION REDUCTIONS FROM COMPOSTING (VOC, AMMONIA): This control measure proposes to achieve VOC and NH3 reductions from composting and related operations in two phases. Under Phase I, a series of rules will be developed which would 1) establish a registration program for composting and chipping and grinding facilities; 2) establish holding and/or processing (e.g., chipping and grinding, on-site applications) time requirements for greenwaste in order to prevent inadvertent decomposition; and, 3) set forth VOC and ammonia emission reduction requirements for co-composting operations. Potential control options may include forced aeration, enclosures, process controls, and add-on controls (e.g. biofilters). In Phase 2, feasible control options will be evaluated and developed for greenwaste and foodwaste composting operations. Rules 1133, 1133.1, and 1133.2 adopted in January 2003 would implement Phase 1 of this control measure.

FSS-04 – EMISSION CHARGES OF $5,000 PER TON OF VOC FOR STATIONARY SOURCE EMITTING OVER 10 TONS PER YEAR (VOC): The federal CAA requires that all stationary sources of VOC emissions (greater than 10 tons per year) in an extreme nonattainment area that has failed to attain the ambient air quality standard for ozone pay a fee as a penalty for such failure (Title I, Section 185). This control measure proposes that if the federal ambient air quality standards for ozone are not met by the year 2010, an emissions fee of $5,000 for each ton of VOC emissions in excess of the ten tons per year shall be imposed on each facility. The fee shall be paid for each calendar year after the year 2010 until the area is redesignated as an ozone attainment area. This fee will be in addition to the annual emissions fee required by SCAQMD Rule 301.

Compliance Flexibility Programs

One control measure proposed under this category was originally contained in the 1999 SIP amendment. Control measure FLX-01 (Intercredit Trading Program) is designed to complement command-and-control measures. The primary objectives of these programs are to enhance regulatory compliance flexibility by providing additional compliance options and thereby lowering compliance costs and to incentivize early reductions and advancement of clean technologies.

FLX-01 – ECONOMIC INCENTIVE PROGRAMS (ALL POLLUTANTS): Control measure FLX-01 (Intercredit Trading Program) is designed to complement command-and-control measures. The primary objectives of this measure are to enhance regulatory compliance flexibility by providing additional compliance

options and thereby lowering compliance costs and to incentivize early reductions and advancement of clean technologies through emission credit banking provisions. This measure along with other existing regulatory flexibility programs such as District credit rules and the Air Quality Investment Program are essential to the successful introduction of the advanced control measures. The District will continue to develop incentive-based credit generation rules to provide technology advancement or early implementation of mobile, area, and stationary source emission reduction projects. Credit rules may be developed for use in RECLAIM, command-and-control programs, or for use by projects subject to New Source Review (Regulation XIII). The EIP will be considered in development of the rules to help facilitate CARB and EPA review and approval.

In 2001, the District adopted six mobile and area source pilot credit generation rules: Rule 1612.1 – Mobile Source Credit Generation Pilot Program; Rule 1631 – Pilot Credit Generation Program for Marine Vessels; Rule 1632 – Pilot Credit Generation Program for Hotelling Operations; Rule 1633 – Pilot Credit Generation Program for Truck/Trailer Refrigeration Units; Rule 1634 – Pilot Credit Generation Program for Truck Stops; and Rule 2507 – Pilot Credit Generation Program for Agricultural Pumps. NO_x emission reductions generated from these pilot credit generation rules can be used in the RECLAIM program either directly or through the RECLAIM Reserve for the Mitigation Fee Program for power producing facilities or the Rule 2020 AQIP for specific RECLAIM facilities. These pilot credit rules may be expanded to generate additional credits for short-term ERCs under REG XIII. Additional mobile source credit rules are anticipated to be developed within the next couple of years to provide additional compliance flexibility.

District's Mobile Source Control Measures

In order to complement the proposed state and federal source control measures, the District is introducing three new control measures aimed at achieving additional emission reductions from off-road mobile sources, described below. The District will exercise its existing legal authority or seek additional authority to adopt and implement cost-effective mobile source controls.

FSS-05 – MITIGATION FEE PROGRAM FOR FEDERAL SOURCES (ALL POLLUTANTS): In order to achieve a fair share reduction commitment from federal sources, this new control measure proposes to implement a mitigation fee program administered by the District and paid for by the U.S. EPA or sources subject to exclusive federal regulations. Federal sources include emission source categories such as aircraft, ocean-going vessels, trains, and pre-empted off-road equipment that are under the jurisdiction of U.S. EPA. These sources continue to represent a significant source of emissions in the Basin in the absence of adequate federal regulations. Under this control measure, the District will use the monies collected to

implement strategies for both federal and non-federal sources to achieve equivalent reductions for SIP purposes. This program would potentially allow a fee to be paid in lieu of federal regulations.

FSS-06 - FURTHER EMISSION REDUCTIONS FROM IN-USE OFF-ROAD EQUIPMENT AND VEHICLES (ALL POLLUTANTS): Although CARB and U.S. EPA have adopted stringent standards for new off-road engines, due to the slow engine turn-over rate, significant emissions remain from in-use engines manufactured many years ago. This control measure proposes that in the event that the CARB or U.S. EPA does not develop aggressive programs to reduce emissions from in-use off-road equipment and vehicle categories (e.g., construction and industrial equipment, recreational vehicles, utility equipment), the District would exercise its authority to develop regulations to retrofit existing engines or accelerate the engine turn-over rate.

FSS-07 - EMISSION FEE PROGRAM FOR PORT-RELATED MOBILE SOURCES (ALL POLLUTANTS): As an alternative to establishing more stringent standards, this control measure proposes an emissions fee program for in-use port-related mobile sources. Under this control measure, the District would establish an emission fee program for port-related vehicles and equipment, such as ships, trains, trucks, and off-road equipment, which would potentially apply to fleet operators of trucks and off-road equipment as well as railroads and shipping and trucking companies. The District will use the monies collected from the program to implement projects with a focus to achieve emission reductions from in-use on-road and off-road mobile sources. When developing this control measure, staff will consider setting emission limits as a companion option in lieu of assessing emission fees.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS' (SCAG's) TRANSPORTATION CONTROL MEASURES

In general, transportation control measures (TCMs) are those actions which provide emission reductions from on-road mobile sources, based on changes in the patterns and modes by which the regional transportation system is used. The various strategies being considered as part of the 2001 Regional Transportation Plan (RTP) are defined, collectively, as a single TCM, with specific interventions and strategies grouped into its following three components:

- High Occupancy Vehicle (HOV) interventions: These are interventions that attempt to shift the proportion of work trips made using single occupancy vehicles—the clearly preferred mode of travel within the Southern California

region, constituting 90% of all home-to-work trips, according to the 2000 U.S. Census—by increasing the share of HOV ridership within the Region. HOV lanes are one example of such projects, where particular segments of heavily used freeways are designated for exclusive use by HOV vehicles, particularly during rush hour traffic. The purpose of such measures is to make car-pooling more attractive to individuals who would otherwise prefer the convenience of a single occupancy vehicle commute trip.

- Transit and Systems Management interventions: These are interventions that rely primarily on the provision of facilities and infrastructure that incentivize an increase in the proportion of regional trips that make use of transit as a transportation mode. Such measures promote the use of alternative modes of transportation—such as bicycle and pedestrian facilities—and seek to incentivize increases in the average vehicle occupancy (AVO) by boosting van-pools, smart shuttles and other such strategies.
- Information Services-based interventions: These are interventions that rely primarily on the innovative provision of information in a manner that successfully influences the ways in which individuals use the regional transportation system. Typically, such measures seek to induce changes in trip behavior that beneficially influence the congestion and air pollution impacts of travel. One set of strategies attempt to increase the proportion of ride-sharing and car-pooling trips by providing information that makes it easier to match up people traveling to and from particular sets of origin and destination points. Another set of strategies attempts to shift the time-profile of demand—thus, transportation demand management (TDM)—by redistributing traffic flows from peak to off-peak hours. These strategies rely on providing single occupancy vehicle operators with realistic and near-real time estimates of congestion using internet-based information networks, in an effort to influence their decision to defer traveling to some other, less congested time of day.

Transportation Control Measure Development

Over the past few decades, there have been significant improvements in the control of emissions from on-road vehicles. These have stemmed, in large measure, from improvements in the efficiency of internal combustion engines and also from dramatic improvements in the emission control technology installed on newer vehicles.[1] However, trends assessed as part of the regional transportation planning process make it clear that the increase in vehicle emissions resulting from increases in the number of vehicles on the road and the number of vehicle miles they are driven, could overwhelm any future benefit from technology improvements. This becomes even

[1] Such measures are outside the definition of TCMs, which are discussed in more detail in Appendix IV-C: Transportation Control Measures.

more significant when taken together with the fact that sport utility vehicles (SUVs), with emissions approximately three times higher than passenger cars per mile basis, currently constitute at least 50% of all new vehicle sales. As a result, it is imperative that the Region seeks alternative and innovative ways to reduce transportation-related air pollution and environmental impacts.

The TCMs specified in the 2001 RTP, as well as the projects listed for implementation in the first two years of the 2002 Regional Transportation Improvement Program (RTIP), were developed as part of an extensive and comprehensive decision making process that actively sought the input of key stakeholders throughout the Region. Various committees and task forces, made up of city and county elected officials, regulators, planners, and community-based groups, have worked to ensure that every viable measure that has the real potential of improving the Region's progress toward attainment of the National Ambient Air Quality Standards (NAAQS), receives due consideration. At the culmination of the process, SCAG's Regional Council recommended that the transportation control measures and strategies proposed as part of the 2001 RTP, along with the investment commitments contained in the 2002 RTIP, be included as part of the Region's air quality plans. These measures and recommendations have accordingly been moved forward for inclusion in the present document. SCAG is currently developing the draft 2004 RTP, which will be used for the next AQMP revisions.

Transportation Control Method Objectives

The central objective of the control methods outlined in the 2001 RTP, and now incorporated into the 2003 AQMP, is to increase (or, at least, maintain at current levels) the proportion of trips made using modes other than single occupancy vehicles. This remains the primary goal of the Region's transportation control strategy, and HOV projects are an important component of such efforts.

However, projects that reduce congestion and improve traffic flows, on freeways and on arterial roads, also have some role to play in mitigating the air quality impacts of transportation. The conventional argument has been that capacity-enhancing congestion relief projects improve air quality by moving vehicles from the higher polluting slow speeds to lower polluting higher speeds. This argument has been countered by the observation that, in cases where capacity is increased to relieve congestion, the act of increasing the supply itself generates an increase in demand. Thus efforts to relieve congestion also increase the total volume of traffic on the roads, within certain bounds. However, while the congestion relief benefits of capacity enhancing projects are certainly less than was previously thought, there are certainly measurable air quality and environmental benefits to projects that improve traffic flows.

Transit and Systems Management projects constitute a second core of the Region's efforts to mitigate the air quality and environmental impacts of increases in traffic activity. These measures include conventional transit projects (bus, commuter rail, subway and shuttle services), non-motorized transit projects (supporting bicycle and pedestrian movement), and inter-modal facilities (park-and-ride lots, van-pool routes). The objective of these measures is to attract as many individuals as possible to non-single occupancy vehicle modes of transportation for peak and non-deferrable work trips. Also considered in this segment are improvements to goods movement-related facilities that carry the potential to either separate freight-related traffic from commute-related traffic, or to otherwise expedite the transfer of goods across diverse modes to transportation.

A third key element is the Region's efforts to implement information-based measures that seek to change travel behavior in ways that mitigate the air quality and environmental impacts of transportation. Some examples of such measures are rideshare programs that seek to match up individuals traveling to and from specific destinations in a way that enables a number of people to share rides to work, rather than driving alone. Intelligent Transportation Systems use computerization, sensor technology embedded in road paving, signalization and ramp metering-types of interventions to modulate the flows of traffic in ways that improve flows and so reduce emissions.

Table 4-3 provides a list of transportation control measures (TCMs) from the 2001 Regional Transportation Plan.

TABLE 4-3
TCMs Programmed and Implemented through the
2001 Regional Transportation Plan (RTP) and the
2002 Regional Transportation Improvement Program (RTIP)

Measures	Description
TCM-1A High Occupancy Vehicle (HOV) Interventions	HOV Projects
TCM-1B Transit and Systems Management Interventions	Bus, Rail and Shuttle Transit Improvements (includes all fixed-route local, express and rapid bus services, light rail service, and commuter rail Metrolink service) Bicycle and Pedestrian Facilities Park and Ride Lots and Intermodal Transfer Facilities Goods Movement Facilities (includes all Baseline projects and the SR-60 truck lane)
TCM-1C Information-based Interventions	Rideshare and Transit Marketing Intelligent Transportation Systems (ITS) (includes Urban Freeway System Management Improvements, Smart Corridors System Management Programs and Congestion Management Plan-based demand management strategies) Telecommuting Facilities TDM Demonstration Programs[1]

The emission reduction benefits associated with implementation of these measures are estimated to be 3.7 tons per day of VOC, 0.2 ton per day of NOx, 0.6 ton per day of PM10, and 57 tons per day of CO in 2010. SCAG is currently finalizing an analytic comparison of the air quality impacts of changes in socio-economic profiles for the 2010 forecasts between the 1998 RTP and the 2001 RTP. The analysis would model the air quality impacts of changes in land use due to proposals contained in the 2001 RTP. The measures contained in the 2001 RTP are expected to demonstrate an overall reduction in emissions for the region of approximately 17 tons per day in VOCs, by the year 2010, which will be reflected in the final 2003 AQMP.

[1] A useful resource for general information on a wide range of TDM strategies can be found at the web site of the Victoria Transport Policy Institute <http://www.vtpi.org/tdm/>.

STATE AND FEDERAL STATIONARY AND MOBILE SOURCE CONTROL MEASURES

The draft 2003 AQMP includes the State's strategy for reducing emissions from sources that are primarily under State and federal jurisdiction, including mobile sources, fuels and the fueling infrastructure, and consumer products.

The on-road motor sources category includes passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, and motorcycles. There are currently approximately 10 million vehicles in this category in the South Coast Air Basin. In 1997, these vehicles traveled more than 307 million miles per day; they are projected to travel about 368 million miles per day by the year 2010. CARB and U.S. EPA have primary authority to reduce emissions from on-road mobile sources, through the adoption of emission standards and other related requirements. SCAG can contribute to this effort through the adoption of transportation control measures that reduce the use of on-road mobile sources. The District has limited authority to impose requirements to reduce emissions from these sources. However, the District has reduced emissions from this source category through its trip reduction requirements for large employers (Rule 2002), fleet rules, vehicle scrapping programs, and incentive programs.

Off-road mobile sources refers to off-road vehicles and mobile non-vehicular equipment categories such as aircraft, trains, marine vessels, farm and construction equipment (e.g., bulldozers), industrial equipment (e.g., forklifts), and utility equipment (e.g., lawn mowers). The authority to develop and implement regulations for off-road mobile sources lies primarily with the U.S. EPA and CARB. The District has limited authority to adopt retrofit requirements for some off-road mobile sources.

Technological breakthroughs over the past 30 years made significant emission reductions possible. Over the next decade, CARB expects to see even greater advances through the development, commercialization, and use of zero- and near-zero emission technologies as well as further development of clean and alternative fuels. These emerging technologies hold promise for several reasons: tailpipe, evaporative and fuel marketing emissions will be eliminated, emission control equipment deterioration or failure will be a thing of the past, toxic and greenhouse gas emissions will be substantially reduced, and emissions associated with the traditional fuels infrastructure will be significantly reduced.

State Strategy

CARB's strategy for achieving additional emissions reductions from the mobile source emissions inventory can be grouped into five approaches: (a) set technology-forcing new engine standards; (b) reduce emissions from the in-use fleet; (c) require clean fuels, support alternative fuels, and reduce petroleum dependency; (d) work with U.S. EPA to reduce emissions from federal and State sources; and (e) pursue long-term advanced

technologies measures. These five strategies would be implemented via the mobile source and fuels measures cited in this Section.

Consumer products include products such as detergents, polishes, cosmetics, hairsprays, and disinfectants, that are used primarily by household and institutional consumers. Consumer products represent a significant source of VOC emissions in the Basin. Overall emissions from this category are determined both by the emissions characteristics of the types of products within the category, and by increases in product usage that are largely tied to population increases. Although existing regulations for consumer products have reduced projected 2010 emissions from this category, VOC emissions from this category are estimated to be about 108 tons per day, or 17% of the total VOC inventory in the Basin. Under Health and Safety Code 41712, CARB has the authority and responsibility to achieve the maximum technologically and commercially feasible VOC emission reductions from consumer products. However, CARB is prohibited from eliminating a product type (e.g., mode of dispensing).

a. **Set Technology-Forcing New Engine Standards -** Technology-forcing emission standards for new vehicles and engines have been at the heart of CARB's mobile source control program. Progressively more stringent emission standards have helped spur improvements in combustion efficiency and advanced engine and after-treatment technology. For many mobile source categories, more stringent standards were adopted under the existing program, and will be phased-in between now and 2010. To achieve and maintain healthful air quality for California residents in the face of increased population, increased vehicle miles traveled, and increased equipment usage, the push toward zero emission technology is absolutely essential. Thus, CARB is proposing the next round of emission standards, which will be adopted during this decade and realize substantial emission benefits by 2020.

The most significant emissions standards in the draft SIP are the national and California Tier 4 emission standards for new diesel off-road engines and for diesel recreational marine engines, which comprise measure OFF-RD CI-1. Although Tier 4 standards will produce only minimal emission reductions in 2010, they are projected to reduce South Coast NOx emissions by 10 tons per day in 2015. Tier 4 standards will result in 27 tpd NOx and 3 tpd ROG reductions by 2020.

Also proposed are standards for new large spark-ignited engines, including forklifts (OFF-RD LSI-1), for small off-road equipment (lawnmowers, leaf blowers, etc.), harbor craft, ships, and aircraft.

b. Reduce Emissions from the In-Use Fleet - Incentive-based programs using public funds have been successful in reducing emissions of VOC and NOx. Some incentive programs, for example the CARB's Lower-Emission School Bus Program and the Carl Moyer Program, are also achieving particulate matter (PM) reductions.

However, the implementation of incentive-based programs was never intended to relieve the private sector of its ultimate responsibility to reduce emissions from the existing vehicle fleet. Therefore, the CARB must now consider other options that require the aging vehicle and equipment fleet within California to reduce emissions and the associated impacts on our State's air quality over the next ten years.

Light- and Medium-Duty Vehicles: Inspection and Maintenance (or Smog Check) programs help ensure that in-use vehicles stay clean as they age. CARB and the Bureau of Automotive Repair (BAR) have implemented a number of near-term improvements to the Smog Check program. Three improvements that remain to be implemented include: 1) loaded-mode testing for gasoline trucks between 8500 and 14,000 pounds gross vehicle weight, 2) an evaporative emission control test to identify excess VOC emissions from leaks in the fuel system, and 3) increasing the percent of vehicles sent to Test-Only stations.

In addition, CARB is currently conducting a Pilot Program to test both light- and medium-duty vehicles to determine the most effective means of reducing in-use emissions. Vehicle testing under the Pilot Program, which targets model year 1995 and older vehicles, will be completed by the end of 2003. The results of the pilot program will be used to determine the emission benefits and estimated costs of implementing light- and medium-duty vehicles parts replacement/repair programs.

Heavy-Duty Vehicles and Equipment: The CARB must also focus its efforts on reducing emissions from in-use on- and off-road heavy-duty diesel vehicle and equipment fleets. While stringent new emission standards will result in significant reductions – this will only occur over time. The durability and performance reliability of the heavy-duty diesel engine means that each one remains in service for an extended period of time, typically 500,000 miles to a million or more miles, diluting the near-term emissions impact of standards targeting only new engines. For both on-road and off-road diesel engines, the CARB will be considering several strategies to reduce in-use emissions. Some examples of these strategies are fleet rules to reduce PM emissions, idling restrictions, and vapor recovery for cargo tanker fueling hoses. CARB also intends to implement a software upgrade program that specifically targets 1993 through 1998 model year on-road heavy-duty diesel engines. These software upgrades, developed by the engine manufacturers and available now, will significantly reduce excess NOx emissions during typical on-highway driving conditions.

c. Require Clean Fuels, Support Alternative Fuels and Reduce Petroleum Dependency - Cleaner conventional and alternative fuels will reduce emissions and enable the new technology envisioned in this draft SIP. One proposed fuels measure would lower the maximum sulfur content allowed in diesel fuel to 15 ppm by 2006, and significantly reduce diesel PM levels for on-road and off-road vehicles statewide. Low sulfur diesel fuel would enable technologies, such as catalyzed diesel particulate filters

and NOx adsorbers that could significantly reduce emissions from on- and off-road engines. Additional measures would control the sulfur in lubricating oil and set additive standards for diesel fuel to control engine deposits.

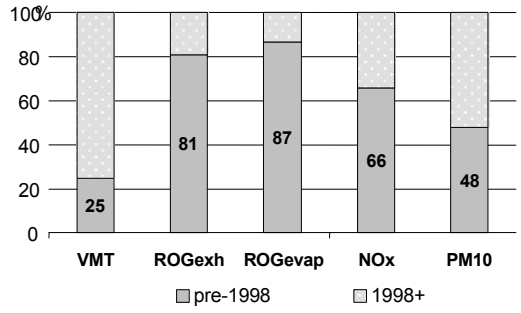
While tighter fuel specifications can enable the next generation of vehicle and equipment technology, alternative fuels and alternative diesel fuels can reduce emissions in the near-term. There are several mobile source and fuels measures that provide for the use of alternative fuels or alternative diesel fuels to yield near-term emissions benefits. One sure way to reduce emissions from fuels is to use less of it. CARB will pursue approaches to reduce petroleum dependency, including looking at advanced technologies, alternative fuels and alternative diesel fuels, lowering travel demand, and reducing upstream emissions.

d. Work with U.S. EPA to Reduce Emissions from Federal and State Sources - Adopted U.S. EPA regulations for interstate diesel trucks and off-road equipment, and the federal requirement for low-sulfur diesel fuel in 2006 for on-road trucks, are critical parts of the strategy to attain federal ambient air quality standards. Additional reductions from sources under federal jurisdiction will be needed if the South Coast is to attain the federal one-hour ozone standard. These reductions can best be achieved through the adoption of federal controls, regulations, or incentive programs.

e. Pursue Long-Term Advanced Technologies Measures - Light- and Medium-Duty Vehicles: There is a wide disparity in emissions between pre- and post-1998 light-duty vehicles. This variation is primarily due to the technological advancements in motor vehicle controls and vehicle design that occurred beginning in 1998, and the results of overall deterioration in the aging motor vehicle fleet. Figure II-4 illustrates how older engines in the light-duty fleet contribute a disproportionate share of emissions relative to their population and usage.

Figure II-4

Older Gasoline Powered Vehicle Contribution Statewide Summer 2010



Other long-term advanced technology measures for light- and medium-duty vehicles include: 1) Voluntary Accelerated Vehicle Retirement (VAVR) – which requires funding, and 2) improvements to the Smog Check program – which would require legislative authority, including removing the rolling 30-year model year exemption (bring the old, high-polluting vehicles back into the program) and extending enhanced smog check to include all eligible vehicles registered in a nonattainment region subject to smog check.

Heavy-Duty Vehicles and Equipment: For both on-road and off-road diesel engines, ongoing funding for incentive programs such as the Carl Moyer Program and the Lower-Emission school bus program would introduce cleaner technology and reduce in-use emissions. Other long-term advanced technology measures include lower U.S. EPA emission standards for new and remanufactured locomotive engines, additional marine reductions, including alternatives to dockside power and propulsion in/out of port and operational controls, and reduced emissions from vehicles traveling to and from airports.

In addition to the proposed measures for mobile sources, the State element also contains specific measures to further reduce VOC emissions from previously unregulated consumer product categories or regulated categories for which further emission reductions are feasible. Mass-based or reactivity-based limits based on reformulation would be considered for these products. Additional measures are also proposed to reduce evaporative emissions associated with fuel storage, transport, and vehicle refueling.

f. Summary

CARB's proposed strategy includes both short-term measures as well as long-term strategies. Table 4-4 is a list of CARB's proposed short-term control measures with an estimated emission reductions of 31 to 71 tons per day of VOC and 25 to 46 tons per day of NOx in 2010. Overall, CARB staff proposes to retain the existing obligation to reduce VOC emissions from State sources by a total of 118 tons per day of VOC in the Basin by 2010, and to provide up to 46 tons per day of NOx reductions beyond the prior commitment (1997/99 currency) based on implementation of short-term and long-term measures. The long-term emission reductions from the CARB's strategy are estimated to provide 47 to 87 tons per day of VOC reductions by 2010. CARB's proposed long-term strategy is presented in the "Long-Term Control Strategy" section of this chapter. If the *Draft State and Federal Element of the South Coat State Implementation Plan* is approved by the State, CARB staff would be obligated to develop the short-term and long-term State measures and present them to the CARB's Board for consideration within the timeframes identified as "action dates", presented in Chapter 7, Implementation. A detailed description of the control measures identified in Table 4-4 is provided in Draft Appendix IV-B - State and Federal Element of South Coast State Implementation Plan.

TABLE 4-4
Proposed State Short-Term Control Measures

Control Measure #	Title/Description	Expected Reductions[1] (tons/day) VOC	NOx
LT/MED-DUTY-1 (CARB)	Replace or Upgrade Emission Control Systems on Existing Passenger Vehicles – Pilot Program.	0-21	0-14
LT/MED-DUTY-2 (BAR)	Smog Check Improvements	5.6-5.8	8.0-8.4
ON-RD HVY-DUTY-1 (CARB)	Augment Truck and Bus Highway Inspections with Community-Based Inspections	0-0.1	0
ON-RD HVY-DUTY-2 (CARB)	Capture and Control Vapors from Gasoline Cargo Tankers	4-5	0
ON-RD HVY-DUTY-3 (CARB)	Pursue Approaches to Clean Up the Existing Truck/Bus Fleet – PM In-Use Emission Control, Engine Software Upgrade, On-Board Diagnostics, Manufacturers' In-Use Compliance, Reduced Idling	1.3-4.3	8-11
OFF-RD CI-1 (CARB)	Set Lower Emission Standards for New Off-Road Compression Ignition Engines	0-0.1	0
OFF-RD CI-2 (CARB)	Pursue Approaches to Clean Up the Existing Heavy-Duty Off-Road Equipment Fleet (Compression Ignition Engines)-Retrofit Controls	2.3-7.8	NQ
OFF-RD CI-3 (CARB)	Registration and Inspection Program for Existing Off-Road Equipment to Detect Excess Emissions (Compression Ignition Engines)	NQ	NQ
OFF-RD LSI-1 (CARB)	Set Lower Emission Standards for New Off-Road Gas Engines (Spark Ignited Engines 25 hp and Greater)	0	0.8
OFF-RD LSI-2 (CARB)	Clean Up Existing Off-Road Gas Equipment Through Retrofit Controls (Spark-Ignition Engines 25 hp and Greater)	0.5-1.4	1.5-3.5
OFF-RD LSI-3 (CARB)	Require new Forklift Purchases and Forklift Rentals to be Electric – Lift Capacity <8,000 pounds	0.7-1.4	2.3-4.7
SMALL OFF-RD-1 (CARB)	Set Lower Emission Standards for New Handheld Lawn and Garden Equipment (Spark Ignited	0.6	0.1

Engines Under 25 hp such as Weed Trimmers, Leaf Blowers, and Chainsaws)

TABLE 4-4 (cont'd)
Proposed State Short-Term Control Measures

Control Measure #	Title/Description	Expected Reductions[1] (tons/day)	
		VOC	NOx
SMALL OFF-RD-2 (CARB)	Set Lower Emission Standards for New Non-Handheld Lawn and Garden Equipment (Spark Ignited Engines Under 25 hp such as Lawnmowers)	5.0	0.8
MARINE-2 (CARB)	Pursue Approaches to Clean Up the Existing Harbor Craft Fleet – Retrofit Controls, Cleaner Fuels	0.1	2.7
MARINE-4 (CARB)	Pursue Approaches to Reduce Land-Based Emissions at Ports – Alternative Fuels, Cleaner Engines, Retrofit Controls, Electrification, Education Programs, Operational Controls	0.1	0.1
FUEL-1 (CARB)	Set Additives Standards for Diesel Fuel to Control Engine Deposits	NQ	NQ
FUEL-2 (CARB)	Set Low-Sulfur Standards for Diesel Fuel for Trucks/Buses, Off-Road Equipment, and Stationary Engines	Enabling	Enabling
CONS-1 (CARB)	Set New Consumer Products VOC Limits for 2006	2.3	0
CONS-2(CARB)	Set New Consumer Products VOC Limits for 2006-2010	8.5-15	0
FVR-1 (CARB)	Increase Recovery of Fuel Vapors from Aboveground Storage Tanks	0-0.1	0
FVR-2 (CARB)	Recover Fuel Vapors from Gasoline Dispensing at Marinas	0-0.1	0
FVR-3 (CARB)	Reduce Fuel Permeation Through Gasoline Dispenser Hoses	0-0.7	0
PEST-1 (DPR)	Pesticide Measure	Baseline	Baseline
Subtotal		**31.0-70.9**	**24.7-46.1**

[1] Expected reductions are from the summer planning inventory for the South Coast Air Basin in 2010

DISTRICT, STATE, AND FEDERAL LONG-TERM CONTROL STRATEGY (182(e)(5) measures or "BLACK BOX")

In addition to the specific new short-term measures defined by the State, District, and SCAG, the ozone attainment demonstration will rely on long-term measures that anticipate the development of new control techniques or improvement of existing control technologies. The federal Clean Air Act (CAA) Section 182(e)(5) specifically authorizes the inclusion of such measures for extreme ozone nonattainment areas – these measures are often referred to as the "black box." The size of the black box is based on the difference between the final attainment target (carrying capacity) for each pollutant and the emissions remaining after application of short-term control measures.

Achieving the reductions ascribed to the black box by the 2010 attainment deadline will pose a tremendous challenge to the agencies, businesses, and residents of California. Based on the latest modeling analysis, the size of the black box for the draft 2003 AQMP is estimated to be 226 tons per day of VOC and 161 tons per day of NOx (which represents approximately 100 tons per day of additional VOC reductions beyond the 1997/99 ozone SIP target).

The draft 2003 AQMP's long-term strategy is comprised of two components: 1) Tier I, which is based on the District's commitment to achieve additional reductions beyond its proposed measures as well as the long-term strategy contained in CARB's State and Federal Element; and 2) Tier II, which is based on the remaining long-term emission reductions needed for attainment demonstration.

Two different scenarios are presented in Tables 4-5A and 4-5B for distributing the Tier II reductions among agencies. Under Scenario 1, recommended by District staff, the 1997/99 SIP commitments by agencies are used as a starting point to allocate the portion of Tier II long-term reductions needed. Since CARB/U.S. EPA have not met their commitments in the 1997/99 SIP (as of 2003), these agencies would be required to achieve the same level of remaining emissions by 2010 as contained in the current SIP. In addition, the remaining emission reductions needed for Tier II long-term measures are then apportioned to each agency based on the contribution of the remaining emissions within each agency's legal authority.

Under Scenario 2, recommended by CARB staff, Tier II reductions will NOT be specifically assigned to agencies, at this time, but would represent the lump sum total reductions needed for attainment demonstration. Further emission reduction assignment would occur over time as specific strategies are identified within each agency's authority. Tables 4-5A and 4-5B provide the overall emission reductions (tons/day) associated with short-term measures as well Tier I and Tier II long-term strategies by agency under Scenarios 1 and 2.

Table 4-5A (Scenario 1)
Emission Reductions from Short-Term and Long-Term Measures[1]

	District		CARB		EPA	
	VOC	NOx	VOC	NOx	VOC	NOx
Short-Term Measures	21.5	5	71	46	---	---
Long-Term Measures:						
Tier I	11	---	47	---	(18)**	---
Tier II	20	---	148*	161*	---	(68)**
Subtotal	31	---	195*	161*	(18)**	(68)**
Total Reductions by Agency	52.5	5	266*	207*	(18)**	(68)**
Overall Reductions	VOC= 318.5 and NOx= 212					

* Includes 68 tons per day of NOx reductions and 18 tons per day of VOC anticipated from federal measures in the event U.S. EPA does not achieve these reductions.
** Reflects the emission reductions associated with federal measures.

Table 4-5B (Scenario 2)
Emission Reductions from Short-Term and Long-Term Measures[1]

	District		CARB		EPA	
	VOC	NOx	VOC	NOx	VOC	NOx
Short-Term Measures	21.5	5	71	46	---	---
Long-Term Measures:						
Tier I	11	---	47	---	(18)**	---
Tier II *	VOC = 168 and NOx = 161***					
Subtotal	VOC = 226 and NOx = 161					
Overall Reductions	VOC = 318.5 and NOx = 212					

* **Includes 68 tons per day of NOx reductions and 18 tons per day of VOC anticipated from federal measures in the event U.S. EPA does not achieve these reductions.**

[1] In addition to District, CARB, and U.S. EPA measures, the draft 2003 AQMP includes reductions from SCAG's transportation control measures (i.e., 3.7 tons per day of VOC) which will be updated in the final 2003 AQMP.

**** Reflects the emission reductions associated with federal measures.**
***** Necessary reductions to be apportioned to responsible agencies for rulemaking and implementation at a later date.**

SCENARIO 1

District's Portion of Long-Term Strategy - After implementation of its proposed short-term measures, the District would be exceeding its emission target in the 1997/99 SIP by about 60 tons per day of VOC; however, in view of the magnitude of the reductions required for attainment demonstration, the District staff is proposing long-term measures to achieve additional VOC reductions from stationary sources. The District's long-term strategy is also made up of Tier I and Tier II components. Under the Tier I long-term strategy, the reduction target is 11 tons per day of VOC with the actual reductions dependent on technology assessments to be performed as part of the rule development process. The Tier I long-term control measures have an adoption date between 2005 and 2007 and implementation date between 2007 and 2009, and targets the source categories such as those in the following control measures:

- CTS-10 – Miscellaneous Industrial Coatings and Solvent Operations (VOC)
- FUG-05 – Emission Reductions from Fugitive Sources (VOC)
- PRC-07 – Industrial Process Operations (VOC)

The reduction target for Tier II long-term strategy is 20 tons per day of VOC reductions in 2010. Any excess reductions achieved during implementation of the short-term commitment will be credited toward the Tier I long-term commitment. The Tier II long-term control strategy has an adoption date between 2006 and 2008 and implementation date between 2008 and 2010, and would target all stationary source categories for which feasible reductions can be identified. Furthermore, permanent reductions in emission estimates due to improvement in inventory methodology are SIP creditable if the changes are approved by the Governing Board at its regularly scheduled public meetings. The District's overall reduction target under the long-term strategy is 31 tons per day of VOC in 2010. The District's long-term strategy is described in Appendix IV-A.

The District is committed to continue actively seeking cost-effective and technically feasible control measures. Once these measures are identified, they will be adopted and implemented as early as practicable while meeting all public notification requirements. Reductions achieved will first satisfy the District's long-term strategy obligations, and any excess reductions achieved will be contributed to the state/federal long-term reduction goals. However, it bears repeating that all source categories should produce their fair share of cost-effective emission reductions.

CARB's Portion of Long-Term Strategy - CARB's Tier I long-term strategy is based on the CARB's proposed long-term measures contained in their State and Federal Element.

CARB will establish a formal process to examine the universe of source categories for which the State has jurisdiction to determine how additional reductions can be achieved to satisfy the remainder of the long-term commitment. The examination will also include approaches that require federal participation and implementation to meet reduction goals. Table 4-6 contains an initial list of possible approaches that CARB staff will pursue to identify suitable long-term measures. Beginning in 2004, CARB will also solicit written proposals for innovative control concepts from the public and conduct technical workshops to further explore promising ideas. CARB expects to identify the remaining measures needed to fulfill the long-term commitment in an expeditious manner, and commits to adopt such measures by the earliest feasible date and implement them prior to the beginning of the ozone season in 2010.

TABLE 4-6
Possible Approaches for CARB Long-Term Strategy

Source	Approach
Light/Medium Duty Vehicles	▪ Provide incentives for voluntary passenger vehicle retirement
Smog Check	▪ Explore program expansion to increase benefits, including: ➢ Statewide enhanced smog check ➢ Opt-in to test-only program ➢ Halting rolling 30-year exemption at pre-1974 vehicles
On-Road Heavy Duty Vehicles	▪ Provide incentives for cleaner trucks and buses, including school buses
Off-Road Class I Vehicles	▪ Provide incentives for cleaner off-road equipment
Ports/Marine	▪ Pursue advanced technologies and innovative strategies – alternatives for dockside power and propulsion in/out of port, operational controls
Airports	▪ Pursue approaches to reduce emissions from vehicles traveling to and from airports

Diesel Engines	▪ Set toxics standard for existing stationary diesel fueled engines – over 50 hp ▪ Set toxics standard for existing portable diesel engines ▪ Set toxics standard for new and existing small stationary diesel engines – under 50 hp ▪ Set toxics standard for diesel fueled refrigeration units on trucks
Fuels	▪ Set sulfur/ash content limits for diesel engine lubricating oils ▪ Support infrastructure for zero-emission vehicles – electric, hydrogen
Consumer Products	▪ Future consumer products regulations
Incentives	▪ Establish clean air labeling program ▪ Continue Statewide energy conservation program ▪ Consider Statewide public education campaign for air quality

SCENARIO 2

As noted above, and in Table 4-5B, emission reductions totalling 168 tons per day of VOC and 161 tons per day of NOx would be apportioned at a later date under the Scenario 2 approach to the long-term measures. Between now and 2006, CARB staff proposes to take responsibility, with the participation of the District and U.S. EPA, to assess potential emission reduction concepts to meet the long-term commitments. All agencies will actively seek to identify additional cost-effective control strategies to achieve the maximum feasible reductions from all source categories. Special attention will be given to achieving reductions from in-use on-road and off-road mobile sources because of the extended life of these sources and their slow turn-over rate. This effort will rely heavily on input and feedback from interested stakeholders. The public's participation will be important both in identifying potential emission reduction concepts and developing approaches to achieve those emission reductions in practice. The support of stakeholders in crafting ways to overcome implementation barriers and providing assistance to ultimately obtain the emission reductions will be a key component to meeting the long-term commitment. As new control strategies are identified, agencies would adopt regulations to implement these measures in the earliest practicable timeframe.

Every type of emission source – mobile, stationary, and area – as well as new and existing -- will need to be evaluated to determine the remaining emissions in the attainment year, and the possibility for further emission reductions. Both new sources and sources already in place will be evaluated for potential emission reduction opportunities.

Together with the interested public, the agencies will evaluate the opportunities to achieve all feasible emission reductions from regulatory programs as well as innovative approaches such as incentives, voluntary programs, episodic controls, and other actions. Part of this evaluation will include a discussion of which agency or agencies can most effectively obtain the emission reductions in practice. For sources such as airports, ports, and rail yards, the agencies will consider facility-based approaches to reduce overall emissions. For these types of sources, a comprehensive approach may be the most effective way to reduce emissions of ozone and fine particulate precursors, as well as address community health concerns. The agencies will also work with SCAG to identify how transportation decisions can support further emission reductions through direct funding of cleaner engine projects or through programs to reduce the rate of growth in vehicle travel. As strategies are defined throughout this process, the responsible agency will begin development as soon as practicable.

On an annual basis, the agencies will hold a technical forum and identify any new control measures that can help implement the long-term strategy. By 2007, the District and CARB will prepare a revision to the ozone SIP that: (1) reflects any modifications to the carrying capacity and (2) identifies the additional strategies needed to provide the remaining emissions reductions, including the specific measures, benefits, timing, and responsible agencies. This schedule would harmonize with development of SIPs to attain the federal eight-hour ozone standard and fine particulate matter standards in the post-2010 timeframe.

The District is seeking public comment on which scenario (i.e., 1 or 2) provides the most appropriate approach. The Final proposed 2003 AQMP will by necessity contain only one of the two options.

Federal Responsibility Under Long-Term Strategy - As established in the 1994 ozone SIP and reaffirmed in the 1999 SIP, the South Coast needs reductions from sources under the legal, or practical, control of the federal government to attain national air quality standards. These sources include vehicles registered outside California that travel within the State, preempted farm and construction equipment, locomotives, marine vessels and aircraft, as well as the fuels sold outside California for these engines. The federal Clean Air Act directs U.S. EPA to continue reducing mobile source emissions that cause or contribute to air pollution that endangers public health.

U.S. EPA and CARB staffs have partnered effectively, sharing technical resources to develop new emission standards and other approaches to cut emissions from source categories under shared authority. For example, parallel regulations will reduce emissions from new 2007 heavy-duty trucks by 95 percent compared to 1998 levels, if fully implemented. The national emission standards for these vehicles are vital to reducing NOx and particulate emissions to meet health-based air quality standards and

reduce the cancer risk from exposure to diesel exhaust. These benefits are reflected in the baseline inventory.

Agencies at all levels must deliver combined new reductions of about 320 tons per day of VOC and about 210 tons per day of NOx to reach the ozone attainment targets in the South Coast by 2010. This plan identifies control measures that the District, SCAG, and ARB will develop to achieve most of the needed reductions, as well as a broad long-term strategy. However, California alone cannot do it all. The sheer magnitude of the additional reductions required to attain necessitates that federal government agencies with authority to control air pollution share responsibility for reaching attainment targets.

To support attainment of the federal one-hour ozone standard (and more protective new federal standards) in the South Coast, California believes that the federal government has a responsibility to further reduce emissions in proportion to the contribution from sources under its jurisdiction to the degree feasible. Federal government action is essential to reach the attainment targets which will require reducing emissions across all sources contributing to the problem.

a. Emissions Contribution

Based on projected 2010 emissions with existing control requirements, sources under federal jurisdiction will contribute one-third of total NOx emissions which form ozone and about half of fine particulate matter (PM2.5) on peak days in the South Coast Air Basin. These sources also emit VOC although in smaller proportion. As California State and local agencies continue to make commitments and adopt new measures, the relative contribution of emissions (especially NOx) from sources under federal control will grow larger.

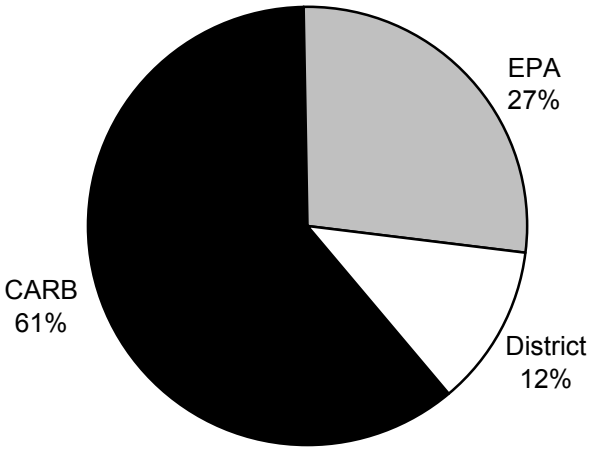


Figure 1
Projected NOx Emissions by Agency

(South Coast Air Basin, 2010, Summer Planning Inventory)

Ozone-forming emissions from most sources are declining over time due to the effectiveness of adopted controls, despite continued population and travel growth. But net emissions from marine and aircraft categories are rising. Between 2000 and 2010, the total NOx emissions from marine vessels are projected to increase 25 percent, with aircraft emissions rising over 30 percent, because the effects of activity growth are greater than the benefits of current controls. In contrast, total NOx emissions will drop by 60 percent for passenger vehicles and 30 percent for trucks over the same period. Marine and aircraft emissions continue to grow dramatically by 2020 without new strategies.

b. Federal Actions to Meet Emission Reduction Targets

U.S. EPA and CARB staffs continue to coordinate on future rulemaking, including three ongoing efforts described in this plan. First, U.S. EPA is developing more stringent emission standards for new off-road diesel equipment based on the transfer of emission control technology for on-road engines. Although the emission reductions from this regulation are expected to be relatively small in 2010, the benefits will be critical in the post-2010 timeframe to both offset growth and make progress toward the new, more stringent federal standards. Second, U.S. EPA is expected to propose phasing in the use of low sulfur diesel fuel in off-road applications nationwide. This will enable the use of more sophisticated control technology on off-road diesel engines. Third, U.S. EPA is working in parallel with California to develop on-board diagnostics and to strengthen manufacturers' in-use testing to ensure that new heavy-duty trucks and buses maintain expected emission levels throughout their useful lives.

ARB and the District expect that U.S. EPA and other federal agencies will secure further reductions, consistent with the emissions contribution from federal sources. To determine the federal emissions target, the emission reduction estimates from the control measures in the draft State and Federal Element identified under federal jurisdiction were considered. In addition, the proportion of projected 2010 emissions from sources under federal jurisdiction in the South Coast Air Basin was applied to the total remaining emission reductions needed for attainment. Thus, the plan relies on the federal government to achieve an additional 68 tons per day of NOx reductions, as well as 18 tons per day of ROG reductions, in South Coast Air Basin by 2010. These totals include the benefits of the three parallel measures described above. Like State and local SIP measures, we anticipate that the federal government may consider a mix of regulatory programs, incentives, or other agreements to achieve reductions.

As part of the State's own long-term strategy, CARB identified possible emission reduction approaches to be evaluated. Accordingly, CARB offers complementary concepts that the federal government could consider, indicated in Table 4-7. Long-term

strategies for new engines in locomotives, ocean-going ships, harborcraft, and commercial and non-tactical military aircraft are feasible and effective means to cut emissions and will be critical to make progress toward all of the national air quality standards. Because of the extended life of these engines, we believe the long-term strategy will need to rely heavily on programs to replace existing engines with cleaner models or to add emission control equipment. Given the volume of equipment in operation and the public health impact of the emissions, it is important that U.S. EPA and its federal partners take early action in this regard.

TABLE 4-7
Ongoing Federal Activities and
Possible Concepts for New Reductions

Strategy	**Name**	**Reductions in Tons per Day (2010)**	
		ROG	NOx
ON-RD HVY-DUTY-3	Pursue Approaches to Clean Up the Existing and New Truck/Bus Fleet (Federal element: on-board diagnostics and in-use testing)	Benefits included under long-term strategy below	
OFF-RD CI-1	Set Lower Emission Standards for New Off-Road Compression Ignition Engines		
FUEL-2	Set Low-Sulfur Standards for Diesel Fuel (Federal element: off-road fuel sold outside California)		
MARINE-1	Set More Stringent Emission Standards for New Harbor Craft and Ocean-Going Ships		
MARINE-3	Pursue Approaches to Clean Up the Existing Ocean-Going Ship Fleet – Cleaner Fuels, Incentives for Cleaner Ships, Smoke (Opacity) Limits		
AIRPORT-1	Pursue Approaches to Reduce Emissions from Jet Aircraft – More Stringent Engine Standards, Retrofit Controls, Cleaner Fuel, Apply Standards to Non-Tactical Military Aircraft		

CARB intends to continue working with the U.S. EPA and other federal agencies on both near-term activities and the long-term strategy. However, the State does not yet have

assurance that the federal government will achieve the emissions targets in the needed timeframe.

To avoid a transportation conformity lapse, local and State agencies need to adopt this SIP revision, and U.S. EPA must find that the transportation conformity emissions budgets are adequate, by spring 2004. To preclude the possibility of transportation penalties, a backstop provision is proposed in the Plan to be triggered if U.S. EPA does not accept the primary control strategy that includes local, State, and federal elements.

The impact of the draft 2003 AQMP's proposed control strategy (including emission reductions from federal sources), referred to as Option 1, as well as the backstop provision (excluding reductions from federal sources), referred to as Option2, on attainment demonstration are presented in Chapter 5.

The primary control strategy provides the greatest protection for public health and the best foundation for meeting upcoming federal ozone and particulate matter standards. (NOx is the dominant contributor to fine particulate levels and a critical component in 8-hour ozone air quality in the Basin.) However, a high priority should be placed on achieving the federal PM2.5 air quality standard which requires aggressive action at this time to demonstrate attainment by the 2014 federal target. The backstop strategy would be equally effective for meeting the first ozone attainment milestone, the federal one-hour standard. However, it would not provide the NOx emission reductions that will be critical in the longer term to attain the new federal eight-hour ozone and PM2.5 standards. It is vital for the federal government to join the State and local agencies in taking early action to address the serious public health consequences of particulate pollution as we design our strategy to meet the federal one-hour ozone standard.

Advanced Technologies

The long-term strategy will require an aggressive development and commercialization of advanced mobile source control technologies. In addition, significant penetration of new and advanced technologies into in-use applications is critical if the additional reductions are to be realized by 2010.

Some of the advanced technologies and innovative control approaches which can be relied on to achieve the additional emission reductions, needed for attainment demonstration, are briefly described below.

Fuel Cells /Advanced Battery Technologies

Fuel cells are electrochemical devices that convert hydrogen and oxygen directly into electricity and water with little or no pollutant emissions. Most fuel cell systems use ambient air as the oxygen source, and the hydrogen fuel is either provided directly to the

fuel cell or produced first from a fossil fuel (e.g. natural gas or methanol). The process of producing hydrogen from a fossil fuel is termed "reforming" and can be done external to the fuel cell or internally within the stack, such as with the high temperature molten carbonate fuel cells. Fuel cells are similar to batteries in that both offer zero or near-zero emissions, high efficiency, responsive power, few moving parts, and low noise. A battery, however, is an energy storage device and can only provide power until its reservoir of stored chemical reactants is spent, at which point it must be recharged. Fuel cells, on the other hand, are energy conversion devices which can provide power as long as the fuel and oxidant are provided. Although fuel cells have been around for decades, the major hurdles affecting their commercialization are their high cost of production, fuel flexibility, fueling infrastructure (for mobile applications), and reliability and durability.

The U.S. Department of Energy (DOE) adopted the Freedom Car Program in January 2002 to accelerate the introduction and commercialization of fuel cell vehicles. Additionally, the TAO program has played a leading role toward addressing these issues and expediting the commercialization of fuel cells for both mobile and stationary applications. For example, the SCAQMD is contributing resources to support both the California Fuel Cell Partnership ("Partnership") and the California Stationary Fuel Cell Collaborative ("Collaborative"). The goals of both statewide initiatives are to advance the deployment and commercialization of fuel cell technologies for clean air and efficiency benefits engendered by the technology. Both the Partnership and the Collaborative seek to form alliances between government agencies and industry to the benefit of California residents.

In addition, the District has been proactive in establishing demonstration projects for the advancement of stationary fuel cells in California. In 2001, the SCAQMD Governing Board awarded a contract to demonstrate ten, 5kW, solid oxide fuel cell (SOFC) systems for residential use in the Basin. A similar residential fuel cell project employing 5kW proton exchange membrane (PEM) fuel cells is also being considered in order to compare the different technologies head-to-head in actual use, in order to assess relative costs, reliability, durability, ease-of-use, etc. In 2002, the Governing Board also approved the release of a Request for Proposals for a larger-scale industrial fuel cell demonstration project. The goal of this project is to deploy multiple 200-250 kW fuel cell units in industrial/commercial applications to capitalize on the heat recovery potential of these higher temperature fuel cell technologies. Demonstrating fuel cells in these industrial settings, where high efficiency and economical operation are demanded, will provide excellent opportunities to identify optimum performance scenarios. The major fuel cell technologies proposed include SOFC, PEM, molten carbonate, and phosphoric acid fuel cells. These data can then be used by other industries to select the most appropriate fuel cell technology for deployment.

Another project anticipated by the SCAQMD is the development and demonstration of an integrated hydrogen production, storage, and fuel cell power facility to be located at the Diamond Bar headquarters. Hydrogen will be produced renewably using an electrolyzer powered by an upgraded solar array; the hydrogen will then be used for fueling internal combustion engine (ICE) vehicles and fuel cell vehicles, as well as fueling an ICE generator and PEM fuel cell for backup and premium power. This demonstration project will exemplify the required technology integration for a near-zero emission hydrogen economy. The engineering, operational, and economical integration scenarios will be addressed to provide data for key decision makers. All of these types of projects will help assess the different fuel cell technologies in realistic situations and advance the commercialization of truly viable products.

Electric & Hybrid-Electric Heavy Duty Vehicles

Hybrid electric systems can vary significantly in their design configurations as well as components. Hybrid electric vehicles (HEVs) can be either parallel or serial systems. Engines of various sizes can either drive a generator to charge the batteries or provide power directly to the wheels or both. The batteries can provide primary power to the traction drive motor or supplement the internal combustion engine (ICE). Some HEV designs can plug in to recharge the batteries, operate battery-only for several miles with the engine coming on just as needed to sustain the batteries. This type of "plug-in" battery dominant HEV can make extended trips by refueling quickly with gasoline or other fuel.

The major automobile manufacturers are actively developing hybrid-electric vehicles with the objective of meeting the CARB LEV II regulations, which provide mechanisms for technologies other than battery electric and hydrogen fuel cells to earn ZEV credits. Hybrid electric vehicles are vehicles with drivetrains that integrate a small internal combustion engine or fuel cell alternator/generator, battery pack, and electric drive motors. Battery fuel cell hybrids are another potential technology being mentioned by battery experts as a way of reducing costs and enhancing performance of fuel cell vehicles.

Innovative approaches to HEV systems are also under development that could improve performance, fuel efficiency, and reduce emissions relative to the first HEVs commercially introduced. Innovations that may be considered for demonstration include: advancements in the auxiliary power unit, either ICE or other heat engine, especially using alternative fuels including natural gas and hydrogen; battery-dominant hybrid systems utilizing off-peak re-charging; and non-conventional light-duty and medium-duty HEVs including delivery vans, shuttles, and other medium-duty vehicles.

The District has been involved in the development and demonstration of energy storage systems for electric and hybrid-electric vehicles, mainly lead acid and nickel-cadmium battery packs. Over the past few years, additional technology consisting of nickel sodium chloride and lithium manganese batteries have shown robust performance, especially in heavy-duty uses. During this time period, other technology manufacturers have further developed other energy storage devices, including ultracapacitors, flywheels and hydraulic systems. Flywheel systems can draw electrical energy from internal combustion engines, microturbines, and regenerative braking systems, store the energy in kinetic form, and are capable of releasing the energy to provide electric power. Hydraulic energy storage systems are available in various forms. Typically, these systems can store retardation energy and provide this energy as a secondary source of propulsion, especially during acceleration. Both energy storage systems can be retrofitted into existing platforms to significantly increase fuel economy, especially in medium- and heavy-duty vehicles with frequent stopping in urban environments.

Marine Vessels and Portside Equipment

Marine vessels and portside equipment, which primarily run on diesel fuel, contribute a significant portion of NO_x, PM10, greenhouse gas and toxic emissions particularly in coastal regions and in and around shipping ports. However, implementation of the cost-effective District and CARB programs has resulted in significant emission reductions through incentive programs such as RECLAIM Executive Order Emissions Mitigation, RECLAIM AQIP, Rule 2202 AQIP, Carl Moyer, and State Emissions Mitigation programs. The primary emission reduction technologies that have been employed so far are engine repowering and engine remanufacturing to achieve lower emission limits.

Currently, the California Maritime Air Quality Technical Working Group, which is comprised of the CARB, U.S. EPA, District, and industry, is exploring promising retrofit technologies to be used on marine vessels. The working group is also working on a marine vessel demonstration project to: 1) identify technologies that are capable of reducing NO_x, PM10, and greenhouse gases; 2) identify and demonstrate emission measurement systems capable of accurately measuring pollutant emissions in ship exhaust streams; 3) install the most promising technology on an in-use vessel for demonstration under real world conditions; and 4) establish the emission reduction potential in different modes of operation. After conducting an in-depth survey, the following technologies have been identified as promising candidates: diesel fuel conditioners, organo-metallic combustion catalysts, catalytic vapor injection, humidification of intake air, selective catalytic reduction with urea and ammonia injection, emission capture and exhaust reduction catalytic separation units, ceramic coatings, water emulsified fuels, alternative fuels, intake air fumigation with temperature control, and fuel injection optimization with high pressure injection. These technologies

have a wide range of cost effectiveness, and can reduce up to 90% of NO_x and PM emissions.

Twin speed marine transmissions can reduce engine speed and hence fuel use and emissions without significantly affecting vessel speed. This technology is applicable to vessels such as crew, supply, pilot, fishing, and recreational boats and possibly barge towing tug boats. While twin speed transmissions are commercially available for certain horsepower ranges and duty cycles, virtually all recreational and commercial vessels in the District use single speed transmissions. The second gear can achieve nearly the same top end vessel speed as a single speed transmission at substantially lower engine RPM and fuel consumption (25% to 30%). Unless the propeller speed is governed (limited), the use of twin speed transmission could result in a substantial increase in vessel fuel consumption. Experimental data indicates that if the propeller speed can be regulated in second gear, it is probable that a twin speed transmission could reduce emissions of all pollutants up to 40% without a significant sacrifice in vessel performance. The District is considering executing a pilot demonstration project using this technology.

For portside equipment, the new technologies that are currently being studied and verified are diesel oxidation catalysts (DOCs) and PM traps. These control devices are being studied on yard hostlers, yard tractors, and other off-road equipment. The DOCs have the potential to reduce VOC emissions by up to 40% and the PM traps can reduce PM emissions by up to 90%. CARB is in the process of verifying DOCs and PM traps for off-road applications. Emission reductions can also be achieved by using alternative fuels. The District is currently involved in yard hostler DOC and water-emulsified diesel projects.

Advanced Engine and Aftertreatment Technologies

Heavy-duty engine technologies are under development to meet the 0.2 g/bhp-hr NO_x standard for 2007 models. These include more powerful electronics for precision engine control, improved air handling (variable geometry turbochargers), exhaust gas recirculation (EGR), and after-treatment systems (particulate traps, oxidation catalysts, lean NOx catalysts, selective catalyst reduction, SCR). For natural gas engines, additional technologies include humidity compensation, stoichiometric combustion, three-way catalysts (TWC) and electronically controlled engine valves ("throttleless" engine). These technologies will enable heavy-duty engines to operate with very low emissions while retaining good performance and acceptable fuel economy. Once these technologies are adopted on new engines and vehicles, they have the capability to achieve even lower emissions as the technologies mature. Future emission performance includes reduced deterioration, possible ULEV- or SULEV-type emissions (0.05 g/bhp-hr NO_x or lower), zero toxics, and better fuel economy.

Emission control strategies for gasoline-, CNG-, and LPG-powered engines generally involve combination of sequential multi-port fuel injection, one or two heated oxygen sensors, three-way catalytic converters, engine control modules, and EGR systems. Public agencies and private industry continue to direct considerable efforts to developing strategies that allow an effective use of natural gas as a cleaner-burning alternative to conventional fuel in automotive service. These efforts have resulted in many options available for improving natural gas engine technology and efficiency, and developing exhaust aftertreatment devices to achieve higher reduction of criteria and toxic pollutant emissions. One such effort is to optimize or reformulate existing oxidation catalyst and develop catalyzed particulate traps to further reduce criteria and toxic pollutant emissions, especially carbonyl (formaldehyde and acetaldehyde) and PM emissions.

NO_x and PM emissions from diesel-powered on- and off-road engines are higher than those powered by natural gas because oxidation catalysts are the only applicable add-on control device for diesel engine exhaust. With the advent of gas-to-liquid, low-sulfur diesel fuels, and other advanced liquid fuels, many emission control technologies that may not otherwise be possible with conventional diesel fuel are now being developed and tested for use in diesel engines. These technologies include lean-NO_x and diesel oxidation catalytic converters, NO_x adsorbers, thermal and catalyzed particulate filters, fuel-borne catalyst, selective catalytic reduction system, and non-thermal plasma discharge system. Many demonstration programs are now showing that PM emissions from diesel engines can be significantly reduced with particulate traps.

The reduction in heavy-duty emissions can be multiplied by incorporating these engines into hybrid vehicles. Such vehicles use two propulsion schemes: a low-emission engine and auxiliary propulsion such as an electric drive system or a mechanical pump and pressure storage system. In addition to propelling the vehicle, the auxiliary systems are used to store energy normally lost during braking and re-use this energy to propel the vehicle, reducing both emissions and fuel consumption. With new heavy-duty engine technologies, natural gas hybrid vehicles have the capacity to achieve near-zero emissions, as low as fuel cell vehicles with onboard fuel reformers.

Renewable Power Generation Technologies

Renewable power generation technologies such as solar and wind electric power generation technologies may also play a role in future long-term attainment demonstration strategies. The District will evaluate the application of renewable power generation technologies through market incentive programs in order to achieve additional emission reductions (e.g., area source credit rule). Future market incentive programs will focus on renewable power generation technologies used in residential and commercial applications.

Advanced Low-VOC Technologies

VOC emissions from stationary sources result primarily from the use of VOC containing materials such as coatings, inks, adhesives and cleaning solvents. The VOC-containing materials are used in a wide variety of industries which include: manufacturing and coating of metal, wood, plastic, and other products; printing operations such as lithography, flexography, screen printing, gravure and letterpress; cleaning operations at repair and maintenance facilities; and numerous industries where adhesives are used.

Some of the advanced low-VOC alternative technologies developed by the industry include: waterborne technologies, radiation-curing technologies, and high solids and powder coating technologies.

Waterborne Technology

One way of eliminating VOC emissions is to replace solvent-based products with waterborne products. Ordinarily, resins were originally solids that were dissolved in the solvents. Upon drying, the solvent evaporates and leaves behind the pigment and resin to form the dried film. With waterborne products, the resins are dissolved in water, but they must dry to a non-water soluble film upon the substrate. Waterborne products also contain some VOCs, which work as a coalescent, provide resin stability, and help achieve certain desirable properties for application. Waterborne technology is quite advanced in most chemistry types, with recent research being done to minimize the amount of solvent or to attempt to switch to the non-HAP (Hazardous Air Pollutant) solvents.

The drying properties of waterborne products are more sensitive to ambient temperature and humidity characteristics, as compared to their solvent-based counterparts. The newer resin chemistries and formulations offer many advantages, which include lower VOC emissions, reduced fire hazards, increased worker safety, lower odor, ease of application, and easy cleanup. Waterborne technology has been successfully used in automotive refinish, industrial maintenance, architectural and marine coatings; flexographic, screen and gravure printing; and adhesives. Overall performance studies completed to date indicate equivalent or superior performance compared to their higher-VOC counterparts.

Radiation-Curing Technologies

Radiation-curing products are liquids with low viscosity that are 100 percent solids. The main difference between traditional solvent-based products and radiation-curing products is the curing mechanism. Radiation-curing products do not dry in the sense of losing solvents to the atmosphere as is the case with solvent-based products. Instead, when radiation-curing products are exposed to radiation, a polymerization reaction starts which converts the liquid to a hard, tough, cured solid film in a fraction of a second. The most common radiations used to cure the products are ultraviolet light (UV) and electron beam (EB). The UV-curing products need a chemical called photoinitiator, which initiates the polymerization (curing) process when exposed to UV-light. The EB-cured products do

not contain photoinitiators and are cured when the electrons generated with the EB equipment react directly with monomers and polymers in the liquid product.

Due to almost instant curing of these products, the concept of drying time is eliminated which allows any post-application operation to commence immediately or in-line. Other advantages include the attainment of very high gloss levels, elimination of VOC emissions and solvent odors, and reduced energy consumption. UV and EB-curing products can be used on virtually all substrates, from metal and wood to glass and plastic. Applications of UV and EB-curing products are numerous and proliferating rapidly. Examples include: paper, furniture, automotive components, no-wax flooring, credit cards, packaging, lottery tickets, golf balls, eye glass lenses, CDs, baseball bats, beer cans and hundred of other items. However, this application has some limitations for field finishing.

High Solids Technology

Another way of reducing VOC emissions is to replace conventional low solids products with higher solids products, thus reducing VOC content. This requires product formulators to increase the solid content, while maintaining the important application and performance characteristics. The characteristics of higher and low solids products are significantly different. This makes the development of high-performance, higher solids products a more difficult formulating task than simply replacing the amount of solvent used in low solids products. A higher solids content increases the viscosity and, in some cases, the surface tension, as well as affecting application and performance properties. While these increases can be minimized by the utilization of lower molecular weight polymers, they can be further reduced by the incorporation of a good solvent system into the formulation. The combination of reducing the molecular weight of the polymer and employing a balanced solvent system has contributed to the successful development of many of the commercial higher solids products in use today.

Powder Coating Technology

Powder coating is a 100 percent solid coating with virtually no VOC emissions. In a powder coating application process, dry paint particles are supplied to a spray gun where particles acquire electrostatic charge. The charged particles are sprayed and attracted to a grounded object and form a uniform layer of powder coating on its surface. The coating is then cured by applying heat.

Some of the benefits of this technology are: solvent-free systems, reduced fire risk and associated insurance costs, reduced waste disposal cost, good solvent and chemical resistance, flexibility and impact resistance. Due to these benefits, powder coatings have become popular with OEM baked coating markets, especially in the decorative market. This system also has limited application for field finishing.

Innovative Control Approaches

Because of the significant level of reductions needed for attainment demonstration, innovative control approaches need to be explored which can be implemented in conjunction with advanced emission control technologies. Three innovative approaches including market incentive programs, reactivity-based controls, and localized controls, are briefly discussed here.

Market Incentive Programs

Since the adoption of the 1997/1999 SIP, the District has adopted several market incentive programs designed to offer stationary sources short-term compliance flexibility while at the same time incentivizing the introduction of low-emission mobile and area source technologies. In 2001, five pilot credit generation mobile and area source rules were adopted to allow generation of mobile source emission reduction credits (MSERCs) and area source credits (ASCs) that could be used as RECLAIM trading credits in the RECLAIM compliance program. A sixth pilot credit generation rule was adopted in 2002. The District has used collected monies from the Executive Order (EO) RECLAIM Mitigation Fee Program for power producing facilities to maximize the funding for low emission mobile and area source projects through the pilot credit generation programs. In turn, these programs have allowed RECLAIM sources to obtain short-term compliance with their RECLAIM allocations while long-term solutions to meeting their allocations are sought. Credit generated under these programs cannot be used past a specific year which in most cases is 2006; however, one rule has a 2010 deadline.

Market incentive programs can continue to play a key role in the development and penetration of low-emission technologies. These programs can be expanded by maximizing the funding sources (e.g., private funding) to provide monies to purchase low-emission technologies. Expansion of these programs will continue to provide short-term flexibility for stationary sources while also producing creditable emission reductions after emission reduction credits can no longer be used (i.e., 2006 - 2010). Thus, any emission reductions still occurring after the rule's specific deadlines may be credited toward the current and future SIP commitments.

Reactivity-Based Controls

Over the past two decades, regulations for coating and solvents have primarily focused on lowering the VOC content which has significantly reduced the VOC emissions from these categories. Reformulation of high-VOC compounds to low-VOC alternatives has resulted in substantial reductions in VOC emissions and improvement of ambient air quality. However, different chemicals used in coatings and solvents would exhibit different reactivity rates in forming ozone in the atmosphere. Therefore, because of the need to achieve additional VOC reductions for ozone attainment demonstration,

reformulation based on lower reactive compounds need to be evaluated and considered in future rulemakings for coatings and solvents in order to provide a viable compliance option. Further study would also be required to evaluate the reactivity of different compounds under various meteorological conditions.

Localized Controls

To complement the AQMP's overall control strategies, localized controls may also be considered to achieve reductions from specific areas which contribute to the exceedance of ambient air quality standards. In instances where the exceedances of the air quality standards are attributed only to emissions from a specific geographical area, it would be infeasible to develop region-wide regulations for the purpose of attaining the standard in a local area. For example, it appears that local PM10 sources in the eastern portion of the Basin are primarily responsible for the exceedance of PM10 air quality in that area. Therefore, it might be more feasible and cost-effective to develop localized controls to achieve the necessary reduction rather than subject the entire Basin to regulations which would not benefit the attainment in the local area. As the District nears the attainment dates for federal air quality standards, localized controls may offer a more viable approach in meeting these standards.

District's SIP Emission Commitment

The SIP commitment of the draft 2003 AQMP is structured into two components: reductions from adopted rules and reductions from the draft 2003 AQMP control measures. Taken together, these reductions are relied upon to demonstrate expeditious progress and attainment of the federal PM10 and 1-hour ozone standards. The following sections first describe the methodology for SIP emission reduction calculations and the creditable SIP reductions, then describe what procedures will be followed to ensure fulfillment of the commitment.

SIP Emission Reduction Tracking

For purposes of tracking progress in emission reductions, the baseline emissions for the year 2010 planning inventory (summer planning for ozone) in the 2003 AQMP will be used, regardless of any subsequent new inventory information that reflects more recent knowledge. This is to ensure that the same "currency" is used in measuring progress as was used in designing the AQMP. This will provide a fair and equitable measurement of progress. Therefore, whether progress is measured by emission reductions or remaining emissions for a source category makes no difference. However, current emission inventory information at the time of rule development will continue to be used for calculating reductions, and assessing cost-effectiveness and socioeconomic impacts of the proposed rule. Therefore, for future rulemaking activity, both the current and AQMP inventories will be reported.

Any non-mandatory emission reductions achieved beyond the existing District regulations are creditable only if they are also SIP-enforceable. Therefore, in certain instances, the District may have to adopt regulations to reflect the existing industry practices in order to claim SIP reduction credit with the understanding that there may not be additional reductions beyond what has already occurred. Exceptions can be made where reductions are real, quantifiable, surplus to the 2003 AQMP baseline inventories, and enforceable through other state and/or federal regulations. Also, any emissions inventory revisions, which have gone through a peer review and public review process, can also be SIP creditable.

Reductions from Adopted Rules

A number of control measures contained in the 1997 AQMP and the 1999 SIP Revision have been adopted as rules. These adopted rules and their projected emission reductions become assumptions in developing AQMP's future year inventories. Although they are not part of the control strategy in the 2003 AQMP, continued implementation of those rules is essential in achieving the clean air goal and maintaining the attainment demonstration. Table 1-2 of Chapter 1 lists the rules adopted by the District since the adoption of the 1997/1999 SIP and their expected emission reductions. As indicated in this table, the emission reductions achieved through adopted rules exceeds the District's SIP commitment by 44.5 tons per of VOC in 2010 for control measures adopted.

Reductions from District's Stationary Source Control Measures

For purposes of implementing an approved SIP, the District is committed to adopt and implement control measures that will achieve, in aggregate, emission reductions specified in Table 4-8A (near-term reductions) and Table 4-8B (long-term reductions). Emission reductions achieved in excess of the amount committed to in a given year can be applied to the emission reduction commitments of subsequent years. The District is committed to adopt the control measures in Table 4-1 unless these measures or a portion thereof are found infeasible and other substitute measures that can achieve equivalent reductions in the same adoption/implementation timeframes are adopted. Findings of infeasibility will be made at a regularly scheduled meeting of the District Board with proper public notification. For purposes of SIP commitment, infeasibility means that the proposed control technology is not reasonably likely to be available by the implementation date in question, or achievement of the emission reductions by that date is not cost-effective. The District acknowledges that this commitment is enforceable under Section 304(f) of the federal Clean Air Act.

Adoption and Implementation of District's Stationary Source Control Measures (Table 4-1) – In response to concerns raised by the regulated community that costly controls may be required to meet the SIP obligations, the District establishes a threshold of $13,500 per ton of VOC reduction for tiered levels of analysis. Specifically, proposed rules with an average cost-effectiveness above the threshold will trigger a more rigorous average cost-effectiveness, incremental cost-effectiveness, and socioeconomic impact analysis. A public review and decision process will be instituted to seek lower cost alternatives. In addition, the District staff, with input from stakeholders, will attempt to develop viable control alternatives within the industry source categories that a rule is intended to regulate. If it is determined that control alternatives within the industry source category are not feasible, staff will perform an evaluation of the control measure as described in the next paragraph. Viable alternatives shall be reviewed by the District Governing Board at a public meeting no less than 90 days prior to rule adoption and direction given back to staff for further analysis. During this review process, incremental cost-effectiveness scenarios and methodology will be specified, and industry-specific affordability issues will be identified as well as possible alternative control measures. The District Governing Board may adopt the original or an alternative that is consistent with state and federal law. In addition, staff shall include in all set hearing items a notification that proposed rules do or do not exceed the cost threshold.

Adoption and Implementation of Alternative/Substitute Measures – Under the draft 2003 AQMP, the District will be allowed to substitute District's stationary source measures in Table 4-1 with other measures, provided the overall equivalent emission reductions by adoption and implementation dates in Tables 4-8A and 4-8B are maintained and the applicable measure in Table 4-1 is infeasible. In order to provide meaningful public participation, when new control concepts are introduced for rule development, the District is committed to provide advanced public notification beyond its regulatory requirements (i.e., through its Rule Forecast Report). The District will also report quantitatively on AQMP's implementation progress annually at its regularly scheduled Board meetings. Included in the reports will be any new control measures being proposed or measures, or portions thereof, that have been found to be infeasible and the basis of such finding. In addition, in the beginning of the year, any significant emission reduction related rules to be considered would be listed in the Board's Rule Forecast Report. Upon finding of a new feasible control measure, rule development will be completed no later than 12 months from the adoption date of the control measure substituted, and implementation of the new measure will occur no later than 2 years from the final implementation date of the measure substituted. The existing rule development outreach efforts such as public workshops, stakeholder working group meetings or public consultation meetings will continue to solicit public input. In addition, if additional technical analysis, including source testing, indicates that actual emissions

are less than previously estimated, the reductions would then be creditable toward SIP commitments. In order for reductions from improved emission calculation methodologies to be SIP creditable, a public review process will also be instituted to solicit comments and make appropriate revisions, if necessary.

TABLE 4-8A
Near-Term VOC, PM10, NOx and SOx Emission Reductions Commitment by SCAQMD
to be Achieved Through Rule Adoption and Implementation
-2010 Planning Inventory-
(Tons/Day)

Year	VOC		PM10		NOx		SOx	
	Based on Adoption Date	Based on Implementation Date[a]	Based on Adoption Date	Based on Implementation Date[a]	Based on Adoption Date	Based on Implementation Date[a]	Based on Adoption Date	Based on Implementation Date[a]
2002	0.6	---	---	---	---	---	---	---
2003	16.9	0.6	0.5	---	---	---	---	---
2004	2.0	---	1.7	---	3.0	---	2.1	---
2005	2.0	---	---	0.16	2.1	---	---	2.1
2006	---	4.8	---	0.86	---	---	---	---
2007	---	2.0	---	0.16	---	2.1	---	---
2008	---	12.1	---	0.66	---	---	---	---
2009	---	---	---	0.16	---	---	---	---
2010	---	2.0	---	0.16	---	3.0	---	---
Total	**21.5**[b]	**21.5**[b]	**2.2**	**2.2**	**5.1**	**5.1**	**2.1**	**2.1**

[a] Represents the final, full implementation date; typically a rule contains multiple implementation dates.
[b] An additional 16 tons of reductions associated with implementation of Rule 1171 – Solvent Cleaning Operations are subject to technology assessments in 2003 and 2004 prior to implementation in 2005 and are not included in this value.

TABLE 4-8B
Long-Term VOC Emission Reductions Commitment by SCAQMD to be Achieved Through Rule Adoption and Implementation
-2010 Planning Inventory-
(Tons/Day)

Year	VOC	
	Based on Adoption Date	Based on Implementation Date[a]
2005	4.0	---
2006	10.0	---
2007	10.0	3.0
2008	7.0	10.0
2009	---	11.0
2010	---	7.0
Total	**31.0**	**31.0**

[a] Represents the final, full implementation date; typically a rule contains multiple implementation dates.

OVERALL EMISSION REDUCTIONS

A summary of emission reductions available by the years 2006 and 2010 for the proposed control measures is provided in Tables 4-9 through 4-12. These reductions reflect the emission reductions associated with implementation of control measures under local, state, and federal jurisdiction. Emission reductions represent the difference between the projected baseline and the remaining emissions. For 2006, Table 4-9 identifies projected reductions based on the annual average inventory for all criteria pollutants (VOC, NOx, CO, SOx, and PM10). It represents the level of emission reductions needed to achieve the federal PM10 standards. For 2010, Tables 4-10 through 4-12 identify projected reductions based on the summer planning inventory for VOC and NOx emissions, the winter planning inventory for CO and NOx emissions, and the annual average inventory for criteria pollutants. Emission reductions by 2010 illustrate the extent of controls needed for achieving the federal ozone standard.

TABLE 4-9

Emission Reductions for 2006 Based on Average Annual Emissions Inventory (tons per day)

Sources	VOC	NOx	CO	SOx	PM_{10}
Year 2006 Baseline	**656**	**927**	**3675**	**58**	**293**
Baseline Adjustments[1]	**(3)**	**(6)**	**(30)**	**0**	**0**
Emission Reductions:					
District's Control Measures[2]	**10**	**0**	**1**	**2**	**1**
CARB's State and Federal Element[3]	**0**	**0**	**0**	**0**	**0**
SCAG's Transportation Control Measures	**2**	**1**	**37**	**0**	**0**
Total Reductions (All Measures)	**12**	**1**	**38**	**2**	**1**
2006 Remaining Emissions[4]	**642**	**921**	**3,608**	**56**	**292**

[1] Baseline adjustments reflect additional revisions made to the draft baseline inventory which will be reflected in the final Plan (see Appendix V for details). () denotes reductions.

[2] Includes District's short-term control measures.

[3] No reductions are claimed from CARB's short-term control measures in 2006.

[4] Includes emissions added for the purpose of set-aside tracking (1 t/d VOC, 1t/d NOx, 1t/d CO).

TABLE 4-10

Emission Reductions for 2010 Based on Summer Planning Inventory (tons per day)

Sources	VOC	NOx
Year 2010 Baseline	629	740
Baseline Adjustments[1]	(2)	(4)
Emission Reductions:		
District's Control Measures[2]	22	3
CARB's State and Federal Element[3]	71	46
SCAG's Transportation Control Measures	4	0
Long-Term Measures	226	161
Total Reductions (All Measures)	323	210
2010 Remaining Emissions[4]	310	530

[1] Baseline adjustments reflect additional revisions made to the draft baseline inventory which will be reflected in the final Plan (see Appendix V for details). () denotes reductions.

[2] Includes District's short-term control measures without control measure MSC-05 (Truck Stop Electrification) to avoid overlap with CARB reductions.

[3] Includes CARB's short-term control measures.

[4] Includes emissions added for the purpose of set-aside tracking (5 t/d VOC, 3 t/d NOx). See Appendix III.

TABLE 4-11

Emission Reductions for 2010 Based on Winter Planning Inventory (tons per day)

Sources	CO	NOx
Year 2010 Baseline	**2,784**	**793**
Baseline Adjustments[1]	**(17)**	**(5)**
Emission Reductions:		
District's Control Measures[2]	**1**	**4**
CARB's State and Federal Element[3]	**0**	**48**
SCAG's Transportation Control Measures	**57**	**1**
Long-Term Measures	**0**	**170**
Total Reductions (All Measures)	**58**	**223**
2010 Remaining Emissions[4]	**2,711**	**568**

[1] Baseline adjustments reflect additional revisions made to the draft baseline inventory which will be reflected in the final Plan (see Appendix V for details). () denotes reductions.

[2] Includes District's short-term control measures without control measure MSC-05 (Truck Stop Electrification) to avoid overlap with CARB reductions.

[3] Includes CARB's short-term control measures.

[4] Includes emissions added for the purpose of set-aside tracking (2 t/d CO, 3 t/d NOx). See Appendix III.

TABLE 4-12

Emission Reductions for 2010 Based on Average Annual Emissions Inventory (tons per day)

Sources	VOC	NOx	CO	SOx	PM_{10}
Year 2010 Baseline	**590**	**756**	**3040**	**58**	**300**
Baseline Adjustments[1]	**(2)**	**(5)**	**(21)**	**0**	**0**
Emission Reductions:					
District's Control Measures[2]	**20**	**3**	**1**	**2**	**2**
CARB's State and Federal Element[3]	**68**	**47**	**0**	**0**	**0**
SCAG's Transportation Control Measures	**4**	**0**	**66**	**0**	**1**
Long-Term Measures	**210**	**163**	**0**	**0**	**0**
Total Reductions (All Measures)	**302**	**213**	**67**	**2**	**3**
2010 Remaining Emissions[4]	**290**	**538**	**2,954**	**58**	**298**

[1] Baseline adjustments reflect additional revisions made to the draft baseline inventory which will be reflected in the final Plan (see Appendix V for details). () denotes reductions.

[2] Includes District's short-term control measures without control measure MSC-05 (Truck Stop Electrification) to avoid overlap with CARB reductions.

[3] Includes CARB's short-term control measures.

[4] **Includes emissions added for the purpose of set-aside tracking (4 t/d VOC, 3 t/d NOx, 2 t/d CO, 2 t/d SOx, 1 t/d PM10). See Appendix III.**